S. HRG. 98-49
PART 5

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1984

HEARINGS

BEFORE THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

NINETY-EIGHTH CONGRESS

FIRST SESSION

ON

S. 675

AUTHORIZING APPROPRIATIONS FOR FISCAL YEAR 1984 FOR PROCUREMENT, FOR RESEARCH, DEVELOPMENT, TEST, AND EVALUATION, AND FOR OPERATION AND MAINTENANCE, TO PRESCRIBE PERSONNEL STRENGTHS FOR SUCH FISCAL YEAR FOR THE ARMED FORCES AND FOR CIVILIAN PERSONNEL OF THE DEPARTMENT OF DEFENSE, AND FOR OTHER PURPOSES

PART 5
STRATEGIC AND THEATER NUCLEAR FORCES

MARCH 15, 18, 21, 23; APRIL 7, 15; MAY 2, 1983

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DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1984

TUESDAY, MARCH 15, 1983

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC AND
THEATER NUCLEAR FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

THEATER NUCLEAR WARFARE ISSUES

The subcommittee met in open session, pursuant to notice, at 8 a.m., in room SR-222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Present: Senators Warner, Cohen, and Levin.

Staff present: James F. McGovern, staff director and chief counsel; James G. Roche, minority staff director; Alan R. Yuspeh, general counsel; Willis D. Smith, deputy staff director and chief scientist for the minority; Richard D. Finn, Frank J. Gaffney, Jr., George K. Johnson, Jr., Patrick L. Renehan, and James C. Smith, professional staff members; Drew A. Harker, research assistant, and Karen A. Love, staff assistant.

Also present: Dennis P. Sharon, assistant to Senator Goldwater; Jim Dykstra, assistant to Senator Cohen; Hank Steenstra, assistant to Senator Quayle; Arnold Punaro, assistant to Senator Nunn; Greg Pallas, assistant to Senator Exon, and Peter Lennon, assistant to Senator Levin.

OPENING STATEMENT BY SENATOR JOHN W. WARNER, CHAIRMAN

Senator WARNER. The subcommittee is pleased to welcome this morning Gen. Bernard W. Rogers, who appears in his capacity as commander-in-chief, U.S. European Command.

General Rogers has served throughout his career with distinction. His testimony has consistently served to illuminate the myriad complex issues with which his various responsibilities have caused him to be involved.

The most recent such issue involves the modernization of NATO's nuclear deterrent forces. The controversies surrounding the deployment of intermediate-range nuclear forces have dominated discussions of this topic in recent months.

With the exception of an article in yesterday's Washington Post, the program for enhancing deterrence at the tactical end of the nuclear spectrum has, however, received relatively less public attention.

As we open up this series of hearings, we look forward to having General Rogers address these and related matters with his usual candor and insight.

I have a note from Senator Nunn expressing his apologies for being absent. He is out of town. We hope other members of the subcommittee will be able to join us this morning.

Having said that, General, kindly launch us on a hopefully successful series of hearings by which we hope to obtain the authorization of this Congress to continue with the modernization program of the strategic nuclear forces.

STATEMENT OF GEN. BERNARD W. ROGERS, COMMANDER-IN-CHIEF, U.S. EUROPEAN COMMAND

General ROGERS. Senator, I come without a prepared statement.

Senator WARNER. I don't recall that you have ever had one. You know this subject so well.

General ROGERS. Let me speak for a few minutes about the intermediate-range nuclear force modernization which we must have. I would like to really address myself to that theater aspect of the nuclear weapons situation.

INTERMEDIATE RANGE NUCLEAR FORCE MODERNIZATION

In December 1979 when the alliance made what I considered to be a vital decision to modernize and at the same time to negotiate the elimination of intermediate-range nuclear forces [INF], it anticipated it might well be successful at the negotiating table prior to the time it had decided to place the weapon systems on the soil of Western Europe in December of this year.

So far there has been no breakthrough, as you know, in the negotiations in Geneva and as a consequence this is going to be a very difficult year for NATO as December approaches if we don't get a satisfactory arrangement in the arms reduction talks.

The decision that was taken in 1979 was a decision to modernize and that is oftentimes lost in the overtones of the debate. We had F–111's which were part of our intermediate range nuclear force. We also had the Vulcans from the United Kingdom.

The Vulcans were scheduled to go out of the United Kingdom inventory, and every year that went by with the addition of more air defense capability on the Warsaw Pact side we knew it was going to be more and more difficult for manned aircraft to penetrate the area over Soviet soil so she could not think that she had a sanctuary.

Most people now believe it was because of the SS–20 that we modernized. We would have modernized irrespective of the SS–20 because we had this gap in our spectrum of defense developing and we needed to close that gap.

We also made that decision in 1979 because we needed to provide a land-based missile system which was shared by a number of our allies, which was visible to the other side and one which was easily con-

trollable and proved to the other side the unity and cohesiveness of the alliance by a number of allies sharing the burden and risks of nuclear weapons on their soil.

There was another reason that that decision was important in December 1979 and that was it gave us the opportunity to go to the negotiating table—the second track of the agreement—with some resolve and some strength represented, by the intent to put these weapon systems on our soil by December 1983 if there was no breakthrough in the negotiation.

First, I believe it was that decision of December 1979 that brought the Soviets to the negotiating table.

Second, we have been very firm in pursuing that decision within the alliance. Construction is underway in Sicily and in the United Kingdom. The Federal Republic of Germany has remained firm in its resolve to put the Pershing II's and eventually ground-launched cruise missiles on its soil.

I believe it is because the Soviet Union has seen that we are serious about this matter that they have abandoned the intractable position they first took of never reducing to less than 300 SS–20's, and now have offered to reduce to 162.

Now, I think that through this year if, as I believe we will, we remain staunch in that decision and continue to move down that path of putting them on our soil, that barring a breakthrough in Geneva, the Soviets find that we are serious, they in turn will negotiate seriously.

We need to give her that incentive for serious negotiation. A failure to put those weapons systems on our soil in December would be very unfortunate. One might say disastrous for the alliance, because we do have a gap in our spectrum of deterrence which we have to fill.

Second, it would show to the world that here was a decision considered vital to the alliance and yet the alliance could not follow through and implement it, mainly because it was opposed by the Soviet Union.

It would reduce any incentive for the Soviets to negotiate seriously in the INF talks. It would throw away that one opportunity that we now have for the first time to eliminate an entire category of nuclear weapons, the land-based, longer range INF weapons from the face of the Earth. Of course, I am talking about the zero level option.

Finally, for all intents and purposes, failing to put those weapon systems on our soil would be giving the Soviet Union a veto on the kind of weapon systems which NATO deploys in order to deter the use of those weapon systems which the Soviet Union has already deployed.

I maintain that this is a precedent that we don't want to set. So, it is a crucial year and it is a crucial decision that must be made.

There are those who speak of postponing deploying the INF missile, let us keep talking and postponing. Well, we would gratuitously give the Soviets an advantage. She continues to maintain this massive force which she has and continues to build additional sites. We now have identified 39 completed sites, with 351 missiles and know that others are under construction.

Also, we have seen the tactics that she has been able to use at the INF talks in Vienna, where she continues to delay and delay any

progress there. That is what we could expect if there were a postponement in this instance.

Senator WARNER. In other words, the INF negotiations would fall in the same sort of pattern as the MBFR talks, which have been inconclusive for a number of years.

General ROGERS. Yes. What incentive does she have? She has everything she wants. We have not yet deployed and we have that major gap in our spectrum of deterrence which I don't think we wish to delay closing.

PUTTING WEAPON SYSTEMS ON NATO SOIL

Now, with respect to the prospects of putting the weapon systems on our NATO soil, I mentioned the United Kingdom, the Federal Republic of Germany and Italy are not waivering on that subject. I am optimistic with respect to the Belgians.

I can only say that I am hopeful with respect to the Netherlands that they may eventually make the decision to also put them on their soil.

I would add a footnote to what I have said. This is a priority for 1983, this decision to deploy the missiles on NATO soil. That is the priority of NATO for this year. We will continue to get the carrot and stick treatment from the Soviet Union. We have to look carefully at those carrots to see if any of them make any sense and we must be impervious to those threats which we see almost every day against one country or another.

To that footnote I would say of equal priority, but it should not have that same equality this year, is the need to improve our conventional forces in Western Europe.

As you have heard me say before, Mr. Chairman, we have mortgaged our defense of Western Europe and the alliance to the nuclear response. I don't like that. We are trying by the end of this decade to get a conventional capacity which has a reasonable prospect of frustrating a conventional attack by the Warsaw Pact.

A number of things need to be done in order to achieve our goal by the end of the decade, but we just must reduce our dependence on the nuclear response for our defense.

With that, Mr. Chairman, I would like to open it up to questions.

Senator WARNER. General, let us turn to the subject of the nuclear freeze. Have you had an opportunity to review the proposal before the House of Representatives today and tomorrow? I will submit two articles from the New York Times.

[The newspaper articles follow:]

[From the New York Times, Mar. 11, 1983]

AN EVOLVING "FREEZE"

(By Tom Wicker)

On the day the House Foreign Affairs Committee approved, 27 to 9, a compromise nuclear freeze resolution, President Reagan in a warlike speech to a religious group denounced the freeze idea as a "very dangerous fraud" that "at current levels of weapons would remove any incentive for the Soviets to negotiate seriously."

Mr. Reagan may not have read the text of what the House committee actually approved. When and if he does (the issue may reach the full House next week) he will find that the resolution does not call for an immediate, unconditional, stop-in-your-tracks freeze of American and Soviet nuclear forces, achieved by some magical stroke from on high.

Rather the resolution establishes several objectives that Congress calls upon Mr. Reagan to seek in transformed Soviet-American nuclear arms negotiations. The most significant of these objectives is as follows: "Deciding when and how to achieve a mutual, verifiable freeze on testing, production and further deployment of nuclear warheads, missiles and other delivery systems. . . ." (Emphasis added.)

Mr. Reagan, however he may have misstated or misconstrued the text, obviously did not underestimate the importance of the committee's action. It approved a "joint resolution"—not a mere nonbinding statement of the "sense of Congress." If passed by House and Senate, the President would be required either to sign or veto it; if he signs, the resolution would have the force of law, and if he vetoes, he probably would face strong political reaction in this country and among the European allies.

No doubt some of those who voted for a nuclear freeze, in numerous state and local referendums last year, will also be surprised to learn that the Congressional resolution calls for it to be negotiated by the superpowers, not merely proclaimed. One of the political attractions of the freeze movement was its apparent simplicity; overnight, so it seemed, there would be no more testing, production or deployment of additional nuclear weapons on either side.

Actually putting a freeze into effect could hardly be that simple—particularly a freeze that was always designed, despite the slurs of opponents, as "mutual and verifiable." Achieving such a freeze will be further complicated by the strong opposition of the Reagan Administration; Mr. Reagan himself continues to impugn the patriotism of freeze supporters, terming them "those who would place the United States in a position of military and moral inferiority."

The joint resolution approved by the House committee attempts to deal with the complexities of putting a freeze into effect. What, for example, would be done under a freeze about replacing worn-out weapons or delivery systems? What verification agreements might be necessary? Would such potentially vital matters as research and development in antisubmarine warfare be ruled out?

A freeze to be negotiated exposes as hollow Mr. Reagan's contention that it would remove Soviet incentives to negotiate. Some months ago, in the so-called Start talks, Moscow indirectly raised the possibility of a reduction in strategic missiles and bombers to about 1,800 on each side—a 25 percent cut for the Russians, a 10 percent cut for the U.S. Why would Moscow be less interested in achieving such a reduction as part of a mutual and verifiable freeze?

As for the European theater, an immediate freeze at "current levels" would leave the Russians an advantage in numbers of intermediate-range missiles. But in negotiating for a freeze, the President still could seek a reduction in the number of these IRMB's, under threat of deploying American Pershing II's as a counter; Congressional and other sources say the terms of the joint resolution "would not preclude" deployment of Pershing II's as part of an overall freeze agreement.

Alternatively, in negotiating such a freeze, Mr. Reagan could rely—as the U.S. and NATO did in the 60's and 70's—on land- and sea-based intercontinental missiles to deter a Soviet missile attack on Europe. One of the objectives set by freeze resolution is to confine the two current sets of nuclear arms negotiation—one on theater missiles, the other on strategic weapons—so that an *overall* Soviet-American nuclear balance could be struck.

Such a negotiated freeze would not even preclude some new weapons deployment on either side, its proponents say, as long as the overall limits of the freeze were observed. A new single-warhead missile might be substituted, for example, for one or two multiple-warhead missiles.

Even after he studies its text, Mr. Reagan is not likely to come around to support of the freeze resolution. It unquestionably represents a Congressional effort, backed by strong public opinion, to force a new direction on his arms control policy, and it may yet confront him with one of the most difficult and important decisions of his Administration.

[From the New York Times, Mar. 15, 1983]

A Freeze Benefits Us Both

(By Alan Neidle)

Alexandria, Va.—Would passage of the House resolution calling for a verifiable United States-Soviet freeze on nuclear weapons undercut President Reagan's ability to negotiate sound treaties limiting and reducing strategic and intermediate-range nuclear systems?

The answer is no. On the contrary, the greater the Congressional support for the resolution, the more likely it is that serious and productive negotiations can take place with Moscow—whether they concern reductions of nuclear arms, freezing various elements of nuclear development or some combination.

Unfortunately, the United States and Soviet Union have not yet begun genuine negotiations on either strategic or intermediate-range nuclear weapons. Proposals have been issued; views have been exchanged. The positions of the two sides, however, remain far apart on a great many major issues. Some observers believe that they can discern the broad outlines of possible deals. But the two Governments have not begun to hammer out specific solutions to numerous points of difference.

When, and if, that process begins, one basic principle may be taken as axiomatic. Neither Government will accept proposals from the other that it considers heavily weighted to its disadvantage. The application of this principle—which is akin to the instinct for survival—will not be affected one iota by whether the freeze resolution is passed or defeated. For example, if the resolution were adopted, even by both houses of Congress, there would still be no chance that the Reagan Administration would accept the present unbalanced proposals put forward by the Soviet Union. Moscow certainly knows this.

Conversely, if the freeze resolution were defeated, there would still be no chance that the Soviet Union would accept Administration proposals that it feels are one-sided. The United States Government ought to understand this.

What will be essential for any progress toward arms control that serves the interests of both sides is genuine compromise. But this will be extremely difficult to achieve.

On the Soviet Union's side, there will have to be greater readiness to accept limitations on, and reductions of, its most modern nuclear weapons—the ones that it considers most effective. Within the Soviet Government, the process of deciding how many of its best weapons to give up in exchange for which concessions from the American side probably will be nothing less than excruciating. Soviet military leaders, who take great pride in their new technological achievements, doubtless will struggle hard to retain as many of their best weapons as possible.

The Soviet Government surely will ask itself hard questions before it decides to go through the tough process of knocking heads together in its bureaucracy. It will want to know whether going through the agony of offering, or accepting, genuine compromises is likely to bring a concrete payoff at the end of the road. It will ask itself whether the United States Government really is capable of carrying a treaty project through to completion—and bringing it into force through ratification.

The United States' recent performance in this regard is, of course, less than reassuring. Three treaties negotiated by Republican and Democratic Presidents in the last decade—SALT II, the threshold test ban and a treaty regulating peaceful nuclear explosions—have not been ratified by the United States.

Senior Soviet officials, and those whose duty it is to give them unsentimental advice, will at the very least have serious doubts whether compromise by the Soviet Union is likely to lead, in the end, to concrete benefits.

No single move by the Reagan Administration can erase the impediments resulting from America's accumulated reputation for inconstancy. But broad support by the public for a freeze and reductions, especially endorsed by the Congress, can help to establish a stronger national constituency for arms control. And that in turn enlarges the long-range prospect that any genuinely worthwhile arms-control treaty will be ratified.

Adoption of the freeze resolution, accordingly, does not undermine prospects for effective negotiation with the Soviet Union. Instead, it increases the chances

that the Soviet Union may at some point judge that it is potentially profitable to engage in genuine negotiations with the United States. But for that day to come, the United States must also be prepared to seek not perfect solutions but those based on mutual compromise. Only when both powers are prepared to proceed on this basis will there be any prospect of significant progress.

General ROGERS. There have been a number and I am not sure I know this one. It has to do with freezing and verifying and then working toward a reduction. I think those are the key principles associated therewith, are they not?

Senator WARNER. That is correct. The essential difference between this freeze and the one Mr. Jackson and I put in a year ago is we had suggested, following the President's guidance, negotiating substantial reductions and then exploring a freeze at these reduced levels.

The question is: Would the implementation of such a resolution apart from any of the legalities would the implications of it being adopted by one or both Houses, although I don't think in my judgment the Senate would follow the House on this, should the House vote in favor of it, what would be the implication on your responsibilities?

General ROGERS. It would adversely affect the efforts of those of us who are working toward what we feel is the long-term goal that all of us want in all the nations of the alliance and that is peace with freedom.

I underscore with freedom in a world with lower tensions and reduced levels of balanced forces, equitable, verifiable. I think the kind of freeze that has been suggested would be a mistake and it certainly would be counterproductive to what we are trying to do in Western Europe.

What we need in my opinion is to provide as many incentives as we can to the Soviet Union to negotiate seriously. But when you freeze an imbalance why should she have any incentive then to negotiate seriously because she has and can keep what she wants?

It is my judgment that we should provide as many incentives as possible for serious negotiation.

The first is the one I mentioned about putting the INF weapon system on our soil, "arm in order to parley," as Winston Churchill put it. What we have to do is to put a cap on the military growth on both sides and then reduce and balance the forces.

We are not achieving the objectives that we ought to be striving for in my opinion by these kinds of movements. It encourages the attitudes and beliefs of many of the people within our Western European nations which are counterproductive to our efforts to accentuate those positive things that impact favorably upon incentives for serious negotiation.

But it is not only the freeze proponents that degrade our efforts. Well-meaning people with a feeling of complacency, feeling that we have for 34 years been successful in deterring an attack with NATO believe we should be able to do so for another three decades. They forget that in the intervening time the balance in all categories of forces we need to implement our strategy has shifted against us.

A lot of wishful thinking is going on in two areas.

One, that the Soviets with their major problems internal to their borders—and they are serious—will find it necessary to reduce the

amount of money they spend each year for military growth. In fact, all the projections right through this week would show a Soviet intent to stay on that upward glide path of military growth she started in the backwash of the Cuban missile crisis.

Wishful thinking that "nothing is going to happen and if it does, somebody else will come along and pull our chestnuts out of the fire." I am speaking about some persons thinking this way in Western Europe and that "somebody else" being this country. I maintain to those people that this country cannot do it alone. It is necessary for them to help.

Then there are those very thoughtful people, young and old, who are worried about a future conflict and in searching for a preventative think pacifism or unilateral disarmament may be the answer. They again forget that history will confirm you can have your peace under those conditions, but you will surely lose your freedom. As I have said so often, the ultimate fate of a pacifist is peace at any price, to include freedom, and under unilateralism you disrobe in the presence of one who is covered with armor. History shows the other side does not disrobe and you throw yourself on its good graces and good will.

That is a long way of saying to you, Senator, that the freeze will encourage those kinds of attitudes and beliefs on the other side. They are counterproductive to what we are trying to do to reach a truly balanced reduction of all categories of forces and arms.

The short answer is that I think that kind of resolution is a mistake.

Senator WARNER. General, as you are aware, much interest is being expressed on the possibility of tabling interim arms control agreement talks on the intermediate-range forces which would preclude the deployment by the United States of Pershing II missiles while permitting a scaled back deployment of the ground-launched cruise missiles (GLCM) and a reduced number of SS–20 missiles.

What would your view be of such a proposal?

PERSHING II MISSILES

General ROGERS. If we have to cut back because we have been unable to achieve that which I think should be our objective, the zero-zero option, then the reduction should be in the ground-launched cruise missiles and not in the Pershing II.

Senator WARNER. Not in the Pershing II?

General ROGERS. Absolutely not. It is the Pershing II that causes the greatest amount of concern to the other side and it is the SS–20 that ought to be causing us the greatest amount of concern because 70 percent of those 351 SS–20's are aimed at us in Western Europe. They ought to have the same source of concern that we do.

It is only the Pershing II missiles, in my opinion, with their penetrability and survivability that provide the greater deterrent to the Soviets against using their SS–20 missiles with their short flight time, their great accuracy and their three warheads to our one.

Senator WARNER. As you know, much is made of the fact that the Pershing II missiles could theoretically be utilized in an attack that would provide no more than 6 minutes of warning to the Soviets.

Could you comment on this contention?

General ROGERS. That it would not give them time to react?

Senator WARNER. Correct.

General ROGERS. I can't feel sorry for them, Senator, because of the number of years since 1977 when they put those SS–20's aimed against us which gives us very little time to react. I can't feel sorry that they have a short time to react as well. This country has faced a very short reaction time for years as a result of the Soviet SLBM's on their submarines just off our east coast.

The fact is the purpose of our putting those weapon systems on our soil is to deter the use of theirs. There are ambiguities and paradoxes in the nuclear era which sometimes some of us forget.

For example, you can defend against a tank with an antitank weapon. How can you defend against a nuclear ballistic missile? You have to build yourself an antiballistic missile system, and this Nation made the decision after it started to build one, when we almost had it ready, we made the decision to tear it down.

So, the way you defend against a nuclear weapon is with a counteroffensive nuclear weapon of your own in order to deter their use by the other side. That is why I think the Pershing II is so important as the counteroffensive, defensive, deterrent weapon system against those SS–20 missiles.

Senator WARNER. In a sense, the fact that it is anti-ballistic, not ballistic, but an anti-intermediate system, is your deterrent at the present.

General ROGERS. The whole purpose of the nuclear weapons is to deter their use or we have failed in our mission. We have failed in our mission if our deterrence collapses and we have to fight.

Senator WARNER. Yesterday an article in the Washington Post referred to the issue of going ahead with developing a nuclear warhead for a proposed new battlefield missile in Europe. It is ironic that the quote intending to substitute this point was taken, I think, somewhat out of context, from your appearance in testimony before this subcommittee last year.

Would you continue on the need as you see it for a balanced modernization program including replacement of aging tactical nuclear artillery shells?

[The newspaper article follows:]

[From the Washington Post, Mar. 14, 1983]

PENTAGON QUESTIONS COMBAT NUCLEAR ARMS

(By Walter Pincus)

The Pentagon, in a reassessment that would reverse 20 years of Army policy, is questioning the need for thousands of short-range, battlefield nuclear weapons that it has deployed or plans to build, according to top Defense Department officials.

The review reflects a realization that the older weapons would be difficult to use in wartime and that deploying the newer ones would create severe political problems.

The review comes as the North Atlantic Treaty Organization is seeking to reduce the approximately 6,000 U.S. nuclear weapons in Europe by at least 572 warheads in conjunction with deployment, planned to start in December, of that number of longer-range Pershing II and ground-launched cruise missiles.

There also is growing public criticism within the United States and in western Europe of short-range nuclear systems.

A report to be released soon by NATO's interparliamentary arm, the North Atlantic Assembly, calls for such reductions, saying "many of the systems lack

accuracy . . . the warhead yields are too large for battlefield use . . . most have extremely short ranges which would mean use on or near 'own territory' . . . and the warhead storage sites are vulnerable to preemptive attack."

The report said there is "growing realization that the present tactical nuclear systems are effectively unusable and therefore NATO has little to lose and much to gain, particularly in a political sense, by reducing if not eliminating them."

In one section, the report disclosed that after 20 years, the western alliance "has not yet managed to agree on guidelines for the follow-on use of nuclear weapons if a first attempt to communicate NATO's intentions through a controlled demonstrative use did not succeed in persuading the adversary to halt hostilities."

Sen. Joseph R. Biden Jr. (D-Del.), chairman of the NATO group that did the study, is circulating a letter to President Reagan for signatures by his Senate colleagues. The letter supports reduction of battlefield warheads.

The immediate issues for Pentagon officials are whether the Army will go ahead with more than 1,000 new 155-mm neutron artillery shells or develop a nuclear warhead for a proposed new battlefield missile, air- and ground-launched, with a range of 150 to 250 miles.

The latter is a joint undertaking with the Air Force.

Also involved in the Pentagon review is how many of about 2,000 older U.S. nuclear artillery shells and more than 1,000 nuclear antiaircraft and atomic demolition munitions with troops in western Europe will be returned to the United States and dismantled.

An Army spokesman said the service would not discuss battlefield weapons.

Last year, Congress turned down initial production money for the 155-mm shells, but $63 million has been included in the fiscal 1984 Pentagon budget now on Capitol Hill.

According to government sources, some Pentagon officials are prepared to drop the request for the shell because of its multibillion-dollar cost, doubts that it can be deployed in Europe in the face of political opposition and unavailability until at least 1986.

The change in attitude toward short-range nuclear weapons is illustrated in proviously classified testimony by Gen. Bernard Rogers, NATO commander and former Army chief of staff, before the Senate Armed Services Committee last year.

Rogers noted that NATO, far behind the Soviets in long-range nuclear missiles, already has "about a 3-to-1 advantage for theater nuclear weapons with a range less than 150 kilometers." That advantage is composed primarily of several thousand nuclear artillery shells, a type the Soviets have not built in any numbers.

During the hearing, another Army general described these older 8-inch and 155-mm shells, many of which are 20 years old, as having "inadequate ranges and inaccurate fuzes." The 8-inch shell, he said "requires time-consuming field assembly" and requires firing of a spotter shell before the nuclear round can be fired.

As to the newer, eight-inch neutron shell being built, Rogers said, "I can get the same effects from the weapons we have now as I can get with the neutron warhead. The only trouble is that it can't be used in as close proximity to our own troops because of the blast and thermal damage of those that we have."

Asked to choose between new neutron shells or new chemical weapons, Rogers responded. "It is more important to me to have the modern adequate chemical capability to retaliate than the neutron weapon.

The administration has asked Congress to approve production funds for a new generation of chemical shells and bombs.

That is a sharply different approach to neutron battlefield weapons, which fewer than six years ago were seen as the major weapon system to defend NATO troops against Soviet tanks.

Rogers and the Army now are stressing a new approach against a Soviet invasion, with emphasis on hitting second-echelon enemy forces well behind the forward lines with conventional rather than nuclear weapons.

The NATO review is being conducted by a subcommittee called the "high-level group" and chaired by assistant defense secretary Richard N. Perle.

The group reportedly has produced interim recommendations for nuclear warhead reductions to accompany deployment of the Pershing II and cruise missiles.

Those findings will be presented to the upcoming meeting in Lisbon of NATO's nuclear planning group. No public disclosure of those findings is expected, but Pentagon sources said that any nuclear warhead reductions would be widely publicized.

Of U.S. warheads currently deployed in Europe, more than 2,000 are old 8-inch and 155-mm artillery shells, and another 600 are warheads for the Lance missile. At least 500 are atomic demolition munitions, nuclear devices to be planted as mines on main invasion routes from eastern Europe into West Germany. About 600 are nuclear warheads for the Nike Hercules, an antiaircraft weapon no longer deployed in the United States.

The remaining nuclear weapons are air-delivered bombs and assorted devices such as anti-submarine bombs and warheads for the Honest John missile, the launcher no longer maintained by the U.S. Army but still in the inventory of Italian and Dutch troops.

The controversial neutron replacements for the old 8-inch artillery shells are being produced, at more than $1 million per shell, but are being stockpiled in the United States. Meanwhile, the old 8-inch nuclear shells, described as unusable during the debate about the neutron weapons, remain in Europe.

About 300 neutron Lance missile warheads also are being produced, at almost $3 million per warhead, according to one industry source. They, too, are being stockpiled here.

Over the last year, the Army has withdrawn some old atomic munitions and warheads for the Nike Hercules, but without public notice.

Perle's NATO group is expected to recommend that remaining Nike Hercules warheads be withdrawn, in part because the antiaircraft system is to be replaced by the Patriot, a new electronic system.

Some older artillery shells also are candidates for removed, according to sources.

SHORT-RANGE NUCLEAR WEAPONS

General ROGERS. I saw that article and its comments attributable to me result from one of two things:

One, and I think we were in closed session, could be that the classified material was cut out in such a manner that there wasn't a complete picture presented. Or it could have been selective reporting. But my position has not changed since I appeared before this committee last year.

Senator WARNER. Excuse me. I have before me the record of our hearings last year and you are correct. The quote was on page 4347 which was in fact in closed session.

General ROGERS. I thought that was the case because I am quoted as having said that the balance is in our favor in short-range nuclear weapons. I think you will remember I said last year that if the Soviets made their 152 millimeter gun nuclear capable, then the balance would shift against us in that area as well. In fact, since my appearance last year, they have made the 152 millimeter weapon nuclear capable. We know that, it is in the public domain. As a consequence, the one advantage we had, the one balance which was in our favor, has now been lost.

What I was represented as having said in the article yesterday was put in the context that we didn't need to modernize our shorter range nuclear weapons.

I have not changed on that subject as I told you last year. I should really talk about most of it in closed session.

Senator WARNER. We want to give you the opportunity to clarify that public report.

General ROGERS. Publicly I can say this, that we do need to modernize the 8-inch warhead, which we are doing. And, in my opinion,

we do need to modernize the 155 millimeter nuclear round for reasons which I can give in closed session. One which I can give in public is that the majority of the artillery tubes that we have in Western Europe within the alliance are 155 millimeter weapons.

Senator, would you give me a chance to talk just a little bit about the question you haven't asked on the numbers of short-range nuclear weapons and other ranges?

Senator WARNER. I was about to ask that question, but I wanted to allow my colleague, Mr. Cohen, to participate in this question. Perhaps if you could touch on that one point, then I will defer to Mr. Cohen. That was to be my next question.

NUCLEAR WEAPONS REQUIREMENTS IN WESTERN EUROPE

General ROGERS. I want to disabuse anyone present who believes that years go by without our ever taking a look at nuclear weapons requirements in Western Europe. As SACEUR, every year I am charged with that responsibility to provide a projection of the nuclear weapons that we need in a certain time span by type and number of weapons and where they would be located within the theater.

Now, I say that because I don't want people to believe that we never look at this subject. Every year I have to put my signature to a piece of paper for the political authorities that says what I believe we need.

Second, I must also put my signature to a piece of paper which is called the nuclear weapons deployment request for those weapons that must be deployed by the nuclear powers to certain nations, according to the programs of cooperation that we have with those nations.

If I am going to put my signature to a paper that says these are the requirements, I want to insure myself that the rationale from which we develop those requirements is grounded in logic.

Senator, we have spent 2 years in trying to get our arms around that very complex subject—and it is complex—but we now have it. We have developed a different rationale. At one time, one could have thought that if you have 16 8-inch tubes of artillery, then you ought to have one warhead or one nuclear round for each tube. That is not based on logic.

We do not yet know what the results will be in the next nuclear warhead requirement study based upon this new rationale.

What I am saying to you is that I now have confidence in that rationale and I, therefore, will have confidence that in the memoranda I send forward in the future, I can look at my political authorities and say that I am convinced that I am not asking for one more warhead in Western Europe than I think we absolutely must have.

We may well find the results will be a reduction in the numbers.

Nike-Hercules, the warhead on Nike-Hercules, no one would rather get rid of that more than I, or sooner than I. Every time the Congress, or a parliament, or the Bundestag or other nations that have agreed to put the Patriot system in our air defense zone in Western Europe, every time they delay deploying it by a year means another year longer that I have to keep those Nike-Hercules nuclear warheads. They are the only threat that drives the Soviet aircraft down to where we can attack them with the improved Hawk weapon.

Above a certain high altitude we have no conventional capability, we have to use the nuclear warhead. If they come in with massive raids of aircraft above that high altitude, the only thing I have is nuclear warheads to use against them. They know we have those warheads. They know we have the first use option. Therefore, our possible response has to be a cause of uncertainty and concern for the Soviets.

The Patriot will replace both Nike and the improved Hawk and it is a conventional weapon. So whenever you see anything, Senator, that says Patriot, say you are for it. I am for getting it over there as soon as I can. When I talk to the Dutch and Germans I ask them to get their Patriot in quickly, to buy their Patriot according to program.

I say that because that is one of the frustrating things we face in trying to get rid of another category of nuclear weapons, these warheads for air defense. I need your help in that area as well.

Senator WARNER. Senator Cohen?

Senator COHEN. Thank you, Mr. Chairman.

General Rogers, welcome. I had the pleasure of sharing the Wehrkunde conference with you this year. I think your participation in that conference was very helpful in stimulating some thinking on the part of the European leaders. I could not help but recall Mr. Egon Bahr's statement at that conference.

You may recall when he said we should go to Geneva and reach whatever agreement the Soviets in essence will agree to. No matter what we achieve by way of negotiation in Geneva, the terms will never be accepted. He said, in any event, the United States will never allow Western deterrence to be blackmailed.

I am also reminded—last week we had members of the freeze movement from my own State in Washington—about the difference in how the Soviet Union approaches a particular problem. I recall a year ago Mr. Brezhnev was tracing the peace movement in Europe and also in the United States.

At the same time that articles appeared of his praise of the peace movement, there were seven people demonstrating in Red Square in Moscow. They had signs that said something to the effect of peace now, stop the arms race. All seven were put in jail.

Last week there was a story carried in the New York Times about a poet dissident. Most poets strike my heart because I have some fondness for them, but a poet dissident was sentenced to 7 years in jail for antistate verses.

So, we are in fact dealing with a necessity to recognize these people do not have the right to demonstrate, to speak on behalf of peace or even to write verses, whether in rhyme couplets or blank verse, that have anything derogatory to say about policies of the Soviet Union.

General Rogers, I would like to talk about what has taken place with respect to the feeling being generated in this country to come up with a new solution? I think Mr. Kohl did perform well during the German elections. Even now, I am reading that he is urging the President to come up with a new proposal.

Today's paper indicates arms negotiations are deadlocked. In what direction do you think we should be moving to come up with a new proposal?

General ROGERS. My hope would be that we would continue to keep our objective of the zero-zero option for the reason I mentioned—getting rid of one category of nuclear weapons. I think that that kind of success could lead to success in other categories. And we need a success.

I find every day in Western Europe there is great interest in trying to achieve an interim solution, which you recall Prime Minister Strauss described as being for the Soviets: The status quo minus Y; and for us: The status quo (zero) plus X.

ZERO-ZERO OPTION

Because negotiations are the art of the possible, in order to get some kind of satisfactory arrangement it may well have to be an interim solution looking toward, in the long term, the zero-zero option. But we have already seen the Soviets move from 300 to 162 and I think they are going to get closer and closer to what is the ideal solution and which, as you know, all of the leaders of governments in Western Europe agree with. I say all, at least the majority of them. So, we need to continue to remain tough until we find that all we could get would be an agreement at a very low level, balanced, equitable, verifiable, with the destruction by the Soviet Union of the rest of its SS–4's, SS–5's, and SS–20's. We should not permit them to shift their missiles toward Japan and China because they are able to shift them back opposite us.

That may be the best we can do, but I am hopeful we can get down to the zero-zero level option. It really won't be until the Soviet Union sees us putting the INF missiles on West European soil and knows that the Pershing II has been successful and is pointed in the Soviet direction that we can hope to come to a satisfactory solution.

Senator COHEN. I might point out, Mr. Chairman, and General Rogers, that during the session I had with members from the State of Maine, I found an intriguing argument being advanced. During the course of the meeting, I was told that we can't deploy the Pershing II. One State legislator mentioned the short flight time to the Soviet Union.

"What is the flight time of the SS–20 to Germany?" I asked. They said, "That is them, that is not us." I said, "Wait a minute. Them is us. We are there. These are our allies."

I thought it was intriguing that this is an issue which the Western Germans just rejected, namely that they are going to go forward with the two-track system as represented by Mr. Kohl and others.

Yet, for the first time I had heard constituents of mine being concerned about the deployment of Pershing II's, that this was going to deter the Soviet Union without regard to any kind of terror the Western Europeans have been experiencing for several years now.

It seemed to me that we ought not to adopt an argument which has been advanced in Western Europe and rejected at least for the time being. Yet, that seems to be one of the focal points of the freeze movement in this country. I just found that for the first time. I had not heard that.

I had heard arguments against that and legitimate arguments against MX, the B–1, Stealth, or Trident. I had never heard the argu-

ment advanced here to me about not deploying the Pershing II because it might cause instability.

Senator WARNER. If the Senator would yield on that, the record should contain the flight time of the SS–20 to the target, which is the same as the Pershing.

MISSILE RANGE AND FLIGHT TIME

General ROGERS. It depends on how far you fire them. Their maximum range is 5,000 kilometers. Ours is much less than that. At their maximum range it may take longer than at our maximum range. Most of the targets for the Pershing II's would be at a shorter range than their targets for the SS–20. I think, as a generalization, it is accurate to say that if they fire their SS–20 and we fire our Pershing II at approximately the same range, about the same time of flight will elapse.

Senator COHEN. Of course, without going into all the details, I assume that the Soviet Union and the United States, respectively, have been on the same sort of time constraints or limitations. We talk about submarine-launched ballistic missile—what could be launched to the Soviet Union and what could they launch against us. It is about the same flight time.

General ROGERS. It is a very short time when you have their nuclear submarines lying off our east coast and our west coast, a very short flight time for those submarine-launched ballistic missiles to reach targets on the east and west coasts.

Senator COHEN. Can you tell us whether or not the NATO high level group agreed in the 1976 timeframe that a sizable number of those battlefield weapon systems could be removed from Europe without jeopardizing the NATO posture?

General ROGERS. 1976 timeframe?

Senator COHEN. Yes.

General ROGERS. If they did, I am unaware of it.

I would just add that although the high level group (HLG) is engaged in a study that would eventually lead to their determination as to the numbers of weapons that we need, or don't need, in addition to the 572 INF missiles. I am hopeful that we don't end up having a situation of just politically pulling from the air a number without consulting with those of us in uniform who bear the responsibility for defense.

I say that, having seen some indications that there are those within the HLG who would like to just say, all right, let us automatically remove *x* number, without referring it to the SACEUR.

Why I am concerned is that when I arrived as SACEUR in June 1979, I said "Show me the SHAPE staff study that supports there being 572 intermediate range nuclear weapons to be placed on our soil in Western Europe:" and there was no such study because we had not been asked.

I said, "Then give me a study that shows how many of those weapons we need." The staff did so and came up with a different number from 572, but at least it was such that, with a high sense of confidence, I could say to the political authorities that as SACEUR I was satisfied with 572.

Now, I don't want that to happen again, Senator Cohen, that this group, which bears no responsibility in implementation of the defense plan, just settles on a figure, says this is the number we are going to have, and it is adopted by the political authorities. That is why for those 2 years we grappled with this complex subject of the proper rationale from which we determine our requirements for number of warheads by type.

REMOVING NUCLEAR WARHEADS FROM EUROPE

Senator COHEN. It is my understanding that since 1979 we have removed about 1,000 nuclear weapons from Western Europe. Is that correct?

General ROGERS. That was part of the integrated decision in December 1979 to remove 1,000 and we did.

Senator COHEN. Did they come to you asking if you were taking them out or did they confer with you in advance, saying we could do this and should do this?

General ROGERS. I was aware of a desire to withdraw 1,000 and I had 1,000 that could be withdrawn at that time. So I had no gas pains on that, Senator Cohen. Within 11 months we had them out.

Now, what is lost by many people is that in that integrated decision document of December 1979 is also the statement that for every one of these 572 INF warheads we put on our soil in Western Europe we are going to pull one warhead out of Europe. I am the certified public accountant on that one, too. We will implement that decision just as written.

Senator COHEN. I think it should be pointed out that it is virtually unknown in Europe that we have in fact withdrawn 1,000 nuclear weapons in 1979, at the same time the Soviet Union was deploying SS–20's at the rate of one a week.

During the period of time that I was in Europe it was completely lost on the Western Europeans. I suspect that if in fact we are going to withdraw more weapons either because we can do so or ought to do so, somehow that message has to be conveyed to the Europeans that we are in fact taking a step to reduce the levels of weapons there. It may be necessary perhaps even to tie that in during the course of the modernization program.

One thing that I have tried to impress upon my own constituency, because I feel those sponsoring the freeze do make a legitimate point, is that there seems to be no end in sight. We keep putting layer on layer of weapon systems when, in fact, the key ought to be whether we can modernize our systems so as to make them more survivable because survivability and capacity are the two key elements, not just the numbers.

NEED TO CONTINUE MODERNIZATION

It seems to me we have to persuade Western Europeans that we have to continue to modernize our systems and put newer systems in. But at the same time, we have to reach some sort of formula in the Senate and in the House as well for the ones being constructed must force a reduction of the overall level of weapons, at the same time recognizing we have to put more survivable systems in our force.

General ROGERS. And the freeze would be counterproductive to that effort.

Senator COHEN. Thank you.

Senator WARNER. General, let me take one note out of my distinguished colleague's comment about mobility. We tend to think about this problem as being across the ocean and over in Europe and to some extent affecting only the NATO nations.

U.S. PERSONNEL IN EUROPE

According to my rough calculations, you have somewhere in the area of 318,000 uniform personnel plus an undetermined number of families accompanying them plus an undetermined number of American civilians working.

What would that aggregate?

General ROGERS. If you will give me a minute, Mr. Chairman, I think I can give you a rough estimate of that. We are mandated by the Congress at 315,600 troops at the end of this fiscal year. This is just for European command. We have 282,000 dependents in the theater, but not all are associated just with my command.

Senator WARNER. You have 315,600 plus 282,000?

General ROGERS. The total theater count is 282,000 dependents. Those dependents in the European Command itself number about 246,000.

Senator WARNER. That is somewhere around 700,000 Americans just associated with your command which is within target range of the SS–20?

General ROGERS. Closer to 600,000.

Senator WARNER. It is not an inconsiderable number of our citizenry directly affected by this threat.

General ROGERS. Not only that, Senator, it is a sizable number to whom we have made a commitment that if anything happens, we are going to come to their assistance. That is a key commitment.

Senator WARNER. Your interest in acquiring a greater ability to target Soviet second echelon forces with conventional standoff weapons has been interpreted in some circles as being intended to replace shorter range tactical nuclear systems.

General ROGERS. That is inaccurate, Senator. What we are trying to do is to develop by the end of this decade a conventional capability that will have a reasonable prospect of frustrating a conventional attack by the other side should it attack.

To do that we must do better with the forces that we already have, bringing them up to Allied Command Europe standards across the board: manning, equipment, training, maintaining, sustaining, and reinforcing.

ALLIED FORCE MODERNIZATION NEEDED

The nations also need to continue to modernize their forces. As we modernize we need to exploit the emerging technology which will permit us to target and strike deep into the enemy's rear with surface-to-surface missiles and air-to-surface missiles, with very accurate, very destructive conventional warheads, interdicting the choke points, bridges, railroad yards and to disrupting, delaying, or destroying their forces as they move forward toward the battle area.

To be successful conventionally we must be strong enough at our general defensive position to hold the initial attack long enough until we can reach back deep into the rear of the enemy and delay and disrupt his follow-on echelons.

We have manned aircraft to do that now, but at the time early in a conflict is when enemy air defenses are going to be the strongest. We are trying to get penetrability with missile systems which are developed or being developed, and if we will only procure and exploit them we can reduce the numbers of enemy follow-on forces that will reach our forward line of troops, so that we can manage their numbers in our defensive posture.

Although it is very important that we do better with the forces we already have by bringing them up to standard, to include their substainability which is our major deficiency. I do believe that the determinant of whether or not we can keep the forces attacking us at manageable levels lies with our using these new weapon systems to strike deep in the enemy rear.

What happens then if we get that capacity for our conventional forces? We will have enhanced our deterrence, raised the nuclear threshold, and reduced our dependence on the nuclear response. Should the Warsaw Pact then attack us and we frustrate their conventional attack, they have two options: withdraw or be the first to escalate to the use of theater nuclear weapons. They are no more anxious to cross that nuclear threshold than are we because of the uncertainty of a further escalation to the strategic nuclear exchange which they, like we, abhor.

RELIANCE ON NUCLEAR WEAPONS

As Senator Cohen heard me say at Wehrkunke, because of the failure to meet commitments in the conventional area by all nations and through trying to buy alliance defense on the cheap by relying on nuclear weapons, we have mortgaged our defense to the nuclear response.

But even if we get to the point where we have high confidence in our level of conventional capacity, we still would want to keep an adequate and appropriate spectrum of nuclear weapons coupled to a first use option so that the Soviets would know that, even if we failed in our conventional defense, we will still have nuclear weapons with which to respond, and therefore the gains for her would be outweighed by the risks and the disadvantages.

Even reaching that conventional posture which we have set as a goal for the end of the decade, we must keep the first use option and an array of nuclear weapons. At that time, though, the political authorities of NATO should point their finger at SACEUR and say, "All right, SACEUR, we have reduced our dependence on the nuclear response. How many nuclear warheads can we eliminate? What is the number to which we can reduce now under those conditions?"

There should be some in addition to what we are trying to do on a yearly basis under our new rationale I mentioned. Nuclear weapons can only be negotiated away. Senator Cohen has heard me say before, the only solution I can find for the kind of future world we want is successful negotiations at arms reduction talks.

That may be a weak reed I am leaning on because you have to negotiate those nuclear weapons away.

Senator COHEN. What you are saying is that before you can reduce the nuclear weaponry, you must build the conventional force capability, because one of the things that is advocated is to freeze the nuclear weapons and rebuild the conventional force structure when, in fact, no one knows whether if you cut back, money will be spent elsewhere.

Your suggestion is let us spend the money to enhance the conventional capability, and then you would be in a position to reduce some nuclear weapons?

General ROGERS. Then there should be a very deep analysis made of how many we can reduce at that time, knowing that we still have to keep an array of a certain number.

Senator COHEN. You indicated that you are quite sanguine about Italy and Britain. I agree with you. I was in Italy and visited with the Defense Minister and members of their armed forces committee. I was really impressed with the commitment the Italians have made to go forward with the ground-launched cruise missle. The same with the British.

The question I have is, if Germany is not to go forward and assuming the decision is not reached to deploy in December, what is your assessment as to what will happen in Italy and Britian?

General ROGERS. I think that would unravel the whole agreement as a consequence. If Germany itself, located where she is with all the danger that she faces, is not prepared to put those weapons on its soil for deterrent purposes, I really believe that would unravel that decision of December 1979.

Senator WARNER. General, I think it is very important that we get all aspects of this down. In your view, is the espousal of attacks on second echelon targets at odds with the defense of the NATO alliance?

General ROGERS. Not at all, Mr. Chairman. Let me describe our concept of operations of which striking deep is a subconcept.

We charge our lead divisions, the divisions occupying our general defensive position, each to handle two enemy divisions opposite them. Those are the first and second tactical echelon divisions of the Warsaw Pact's first operational echelon.

Our second subconcept of operations calls for our reserves in, say, the Northern Army Group and Central Army Group areas to take care of the enemy's second operational echelon forces or any Operational Maneuver Groups—exploiting forces—which may have broken through.

Then our third subconcept calls for us to attack both mobile and fixed targets in the enemy's rear area.

What I am talking about is interdiction. We have had interdiction from time immemorial, but this will be very accurate and on specific targets which we would quickly locate, target, get the information to a joint tactical fusion center where human judgment is exercised by man and pass it to a weapon system to attack the target before it leaves. Fixed targets will stay put but we must get our missiles or manned aircraft over mobile targets before they move. Remember in World War II, we would sit out there at night with our artillery and every 10 or 15 minutes, we would pop off two or three rounds at a

crossroads, just hoping we could catch somebody at those crossroads at the time.

Senator WARNER. That was at the start of World War I?

General ROGERS. You know, that, too, was interdiction and what I am talking about is a modernized form of interdiction.

It has been misconceived by some because it has been associated with the U.S. Army's AirLand Battle 2,000 (ALB 2000), which is a conceptual, speculative attempt to determine what the battlefield is going to look like at the end of the cenutry. But ALB 2000 has aspects to it which are not applicable to the defense of Western Europe.

I have had very intelligent individuals in Western Europe who should know better, who, because of a little bit of knowledge about ALB 2000, accuse me of going to have massive forces attacking across the German border headed toward Prague and toward Warsaw.

Nonsense! All we are trying to do is to strike deep with more sophisticated, more survivable, more reliable, more penetrable, and more accurate weapon systems to hit the targets that the attacker will provide for us.

We have watched the Group of Soviet Forces Germany on its maneuvers. I can tell you that Murphy's Law applies on both sides of the German border. We are not the only ones that make mistakes. They are presenting us with some very lucrative targets, tanks nose to tail in long columns, tanks that go into an assembly area "all bunched up", as we would say in the infantry jargon.

One can assume that for the first few days of the war—and that is the period I am talking about—the Pact troops are going to fight the way they train. We assume that about our troops. The other side provides some very lucrative mobile targets in addition to the fixed targets that don't move—bridges, railroad yards, command and control centers, and logistic facilities.

That is the third subconcept of our concept of operations.

In summary, the first subconcept calls for our divisions on our general defensive position to take care of two enemy divisions in the Warsaw Pact first operational echelon. The second subconcept is for our Army Group Reserves to handle the enemy's second operational echelon or any Operational Maneuver Groups that may punch through our defenses. The third subconcept is reaching back deep into the enemy's rear with weapon systems, delay or destroy the follow-on forces so that we reduce to manageable proportions the number that will be attacking us at the forward edge of the battle area.

We plan no change to our forward defense which is so essential in Western Europe, both politically and militarily. Nor to our deterrent strategy of flexible response. What we are doing is providing additional flexibility to the flexible response by improving our conventional capacity.

MAINTAINING CREDIBLE NUCLEAR CAPABILITY

Senator WARNER. That brings us to the next question.

The issue we face is one of maintaining a credible nuclear capability. The argument is made that such systems would be quickly overrun and then would be useless or else they have to be used in the event of attack very quickly.

General ROGERS. One can always design scenarios so that you end up with disaster in anything you try to do. If we are attacked at the outset with Warsaw Pact nuclear weapons—and we are never sure, but we might be—I would expect our short-range battlefield weapons would be used very quickly to reduce the odds against us. But if we were not attacked at the outset by nuclear weapons and only attacked conventionally, then I would anticipate not using the short-range nuclear weapons on our own soil first. And only when we were losing the cohesiveness of our conventional defense, would I request using some kind of nuclear weapons that could reach non-Soviet Warsaw Pact soil and/or Soviet soil. Under those conditions and under my guidance, we would strike only military targets important to us and to the other side in those numbers necessary to let them know that we are prepared, before losing the cohesiveness of our defense, to use any means available to defend ourselves.

That is the guidance under which I function at the present time. Under those conditions, I would not anticipate the early use of the short-range battlefield weapons upon our own soil.

So it depends, obviously, on the kind of scenario we are talking about, Mr. Chairman.

FRENCH AND BRITISH STRATEGIC NUCLEAR SYSTEMS

Senator WARNER. What contribution to your theater nuclear target coverage do the French strategic nuclear systems make and the British?

General ROGERS. The British strategic forces are assigned to me as SACEUR, committed to me. So we have full use of them.

In the joint strategic targeting office at SAC headquarters, we have British representatives on my team which is there coordinating the nuclear forces of both the United Kingdom and the United States.

With respect to the French, although our coordination and cooperation is extremely close and is as close now as with the previous administration, there are certain aspects about their forces which are inviolable.

One is the French forces do not intend to reintegrate into the military structure of NATO.

Second, the French intend to retain an independent nuclear force, and, third, they intend to retain the independent use of that independent nuclear force.

To go further I need to go into closed session.

REACHING AN INF ACCORD

Senator WARNER. Of course, that raises the question of how we reach an INF accord with the presence of those two systems.

Do you want to touch on that?

General ROGERS. With the exception of a very few number of missiles, the British and French nuclear systems are in fact strategic weapons. If they are going to be taken account of, they should be taken account of in the strategic talks, not in the INF talks.

In addition to that, the British and the French have said that these are bilateral talks between the United States and U.S.S.R. and there-

fore their weapons system will not be taken into account under any conditions.

Senator WARNER. Do you believe the effective verification of the interim proposal would be substantially more difficult than the verification of the zero option?

General ROGERS. Yes, in the sense that an interim proposal would probably include some GLCM's. And it is very difficult to determine the kind of warhead a ground-launched cruise missile may have, whether it is conventional or nuclear. But we face that problem somewhat today.

Two aircraft may be flying over and you don't know whether one, both, or neither has nuclear weapons aboard. You have an artillery batallion in East Germany that has deployed its nuclear weapons. You don't know if the next round it may fire will be conventional or nuclear.

Mr. Chairman, irrespective of the conclusions that are reached at the arms reduction negotiations, verification is going to be, as you know, the toughest one with which to deal.

CHEMICAL WEAPONS

Senator WARNER. General, each year we have to bring up a very difficult subject of chemical weapons. As you know, I personally have been a strong proponent of the need to modernize our chemical deterrent capability.

Would you give your opinion with respect to the impact of the action of last year's Congress which deferred the chemical modernization program? What has been that impact on your ability to adequately train and plan for defensive measures against the use of chemical weapons in your forces?

General ROGERS. On the defensive side, Mr. Chairman, this country continues to make progress in providing the warning systems, the overgarments, the boots, gloves, and so on, that are needed for defensive purposes.

Where this Government has not taken the action which I had hoped for a number of years it would take, is to permit the production of two types of modern chemical weapons for use in retaliation. We have chemical weapons in our inventory, the last ones built in 1969. The wall of obsolescence we have discussed before gets closer and closer despite our maintenance of those weapons, obsolescence caused by deterioration of the chemical warhead and by the deterioration of the projectile that gets the warhead to the target.

If I were writing my own ticket from where I sit as SACEUR, it would be to develop and produce two binary rounds, one for short-range artillery, and the other the Bigeye bomb filled with a persistent chemical to attack and prevent the use by them of sites such as airfields, communications centers, logistics facilities, nuclear storage sites, a whole series of such targets. But our weapons would only be used in retaliation for their use against us, never first use of chemical weapons by our side.

They know that our retaliatory capability is extremely limited and they also know that if you wear one of the protective garments for any length of time your efficiency is reduced by about 70 percent.

I still believe that this Nation should produce those two kinds of chemical binary rounds. We don't even have to talk about deploying them to Western Europe. Leave them here. But the mere fact that the Soviet Union sees us doing this, I think will have two salutary effects.

The first one is the Soviets will be more serious at the negotiating table as we try to negotiate the destruction and elimination of all chemical weapons from the face of the Earth, which should be our ultimate objective. We have negotiated with the Soviets with that as our objective, but why should she negotiate seriously when she knows what an advantage she has?

Second, it would give us a retaliatory capability so that, as in World War II when both sides had chemical weapons but neither side used them, there might again be mutual nonuse. We have no assurance at this time that the Soviets will not use chemicals offensively; we know they do in their exercises.

Senator WARNER. Senator Levin?

Senator LEVIN. Thank you, Mr. Chairman.

Senator WARNER. It is the intention of the Chair to let the Senator from Michigan question in open session here for a brief period. Then we would like to have a short closed session, General Rogers, which I would anticipate may be 15 or 20 minutes in duration.

The subcommittee will then reopen the hearing for the purposes of hearing or having Richard Perle testify in open testimony for a period and then we will again resume in executive session.

Senator Levin, if you will question.

Would that be agreeable to you, General?

General ROGERS. Yes.

Senator LEVIN. Good morning, General.

IMPROVING OUR CONVENTIONAL FORCES

General, you recently have been quoted as saying that the conventional imbalance in Europe is dangerous because it could push us into a premature use of nuclear weapons and that we should improve our conventional forces more quickly in Europe in order to avoid that imbalance.

Your subordinate commander, General Kroesen, has said in somewhat different words—he seems a bit more optimistic—he too recognizes the specter of nuclear escalation, but he is quoted as saying that "We can defend the borders of Western Europe with what we have, I do not think the conventional defense is anywhere near hopeless."

He said that he estimated that with the promised reinforcements, existing war reserve materiel, fuel rations would sustain battle for 30 days, kind of giving a somewhat different view than what you were quoted as saying.

Do you not share General Kroesen's optimism? Is there a difference between you in that regard?

General ROGERS. There is absolutely no difference between the two of us. I have to take into account not just the United States forces—the United States is not going to fight that war alone. It would be a coalition war. In the central region there are eight corps. Only two are United States.

Second, as General Kroesen would say to you if he were sitting here, I can, with sufficient warning time and with appropriate and timely

decisions by political authorities, under optimal conditions, defend against the initial attack. But he, as I, will also point out to you that X day comes when, just as I have always said, X day comes when we run out of ammunition, pre-positioned war reserve stocks to replace losses on the battlefield, tanks and howitzers and manpower.

Therfore, he would say, that under optimal conditions he can hold initially. But he also will say that there is a day that comes when he can no longer hold. That is what I have always said. I put it a little differently because I have to look at it from the standpoint of all the nations who have forces committed. Although the United States is in better condition with respect to its ammunition stocks and its pre-positioned war reserve material stocks than are the allies, what I must say is that what we have today is a strategy of the "delayed trip wire" and by D plus X day we are no longer able to sustain ourselves in conventional combat.

I can give you that X day which concerns me in closed session.

The guidance under which I function is: SACEUR, before you lose the cohesiveness of your defense and it is threatened by major penetration, you must request the release of nuclear weapons.

General Kroesen and I come out the same way, just saying it a little differently.

Senator LEVIN. Relative to the issues of what that uniform strength is that you command, I squared S squared gives total manpower in uniform figures.

United States-NATO within Spain, 4,998,000. Soviet Union, 4,821,-000.

What are the figures that you use?

General ROGERS. The figures that we use generally, I think we have about 80 percent more manpower total than the Warsaw Pact. I would want to check it for the record.

We have four times the gross domestic product in NATO than they have in the Warsaw Pact.

Senator LEVIN. I am talking about men in uniform.

General ROGERS. We can get to 6 million NATO troops if we have full mobilization of all nations.

Senator LEVIN. What do we presently have in uniform?

General ROGERS. About 2.6 million troops.

Senator LEVIN. What do they have?

General ROGERS. At least 6 million.

Senator LEVIN. With mobilization we would get to 6?

General ROGERS. We would get to 6 million.

Senator LEVIN. And they would get to what?

General ROGERS. 9.5 million.

Senator LEVIN. Do you know where I squared S squared gets total figures for United States-NATO of 4.9 million? The Soviet Union 4.8 million?

General ROGERS. What is I squared S squared?

Senator LEVIN. International Institute of Strategic Studies in London.

General ROGERS. IISS I understand, but I squared S squared I don't. I talked to the director of that institute about where they get their figures and they have sources which are quite reputable.

Although we do not always agree with their figures, we don't argue much with most of what they produce.

Senator LEVIN. On the interim solution zero option issue apparently a number of our NATO allies have urged us to propose some kind of interim alternative. I understand this morning that you said we ought to hold fast as long as we can to the zero option.

They have urged us to make an interim solution offer of some kind before March 28 before those talks recess on March 28.

What is your feeling about that?

General ROGERS. My feeling is that that determination has to be made by the President with the guidance from his people who sit in on the negotiations at Geneva as to whether or not it makes any sense.

Senator LEVIN. He said we should hang tough as long as we can. Is March 28 long enough?

General ROGERS. Frankly, I don't think that we are going to get the kind of acknowledgment from the Soviets that they are serious until along about December and only then when we put these weapon systems on our soil. At that time I think we are going to come much closer to the zero level option than the 162 that they now offer.

So, I would hope that we would not be too hasty in offering another interim solution. But that is something to be weighed between those who are doing the negotiating for us and those who have to make that decision.

Senator, I certainly agree with the premise that the emphasis by most of the nations in Western Europe is for the United States to come forward soon with an interim solution. That is how I read their desires, too.

Senator WARNER. One last question, General, and then we will go into executive session.

SUSTAINING 90-DAY AMMUNITION SUPPLY

There has been a report recently by Mr. Bundy and Mr. McNamara, Admiral Zumwalt and others to the effect that this 90-day goal for sustaining ammunition supplies is one that we should concede in an effort to find some cost savings in the President's defense budget and we should drop back to a goal of 45 days.

I think their thesis is predicated on the inability of the allies to have a sustainability of even 45 days and they dramatize the position that you say the United States stores there would possibly sustain capability, but the other NATO allies would not.

Have you seen that report?

General ROGERS. It is true that most of the NATO nations other than the United States are not yet meeting the ammunition stockage level that we have set as 30 days.

On the other hand, we have a commitment to those U.S. troops that we have there that they don't run out of ammunition.

Second, the Congress gave authority 2 years ago for the reallocation among allies of excess U.S. materiel and ammunition. In fact we made in Wintex 83—our biennial winter exercise—which finished last week the reallocation of materiel among regions within Allied Command Europe. It has included not just reallocation of ammunition, but it has included reallocation of other types of materiel from nations other than the United States to other nations in the alliance.

Although I am not one who advocates making a major issue about reallocation, because we want to encourage the allies to reach the 30 days, it is something that, should an emergency start tomorrow, would be very important to me because much of the 155-mm ammunition which constitutes the bulk of our artillery is transferrable and can be used by the 155 weapon systems of our allies.

So, we have to keep those two things in mind. I think the goal has been set, Mr. Chairman, at 75 days with interim objective up to, I believe, about 60 days. The United States has not yet reached that point.

Senator WARNER. So you would urge the Congress to continue with the funding necessary to provide the same ability in excess of the 45 days?

General ROGERS. Yes, sir.

Senator WARNER. At this point the subcommittee will go into executive session with the expectation we will resume in open hearing in perhaps 20 minutes.

[Whereupon, at 9:25 a.m., the subcommittee proceeded in executive session.]

EXECUTIVE SESSION

The subcommittee proceeded in executive session at 9:28 a.m., in room SR-222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Members present: Senators Warner, Quayle, Exon, and Levin.

Staff present: James F. McGovern, staff director and chief counsel, and James G. Roche, minority staff director; Frank J. Gaffney, Patrick L. Renehan, and James C. Smith, professional staff members; and Karen A. Love, staff assistant.

Senator WARNER. General, I think we have established that the room is now secured.

General ROGERS. I thank you for that.

I have three items you wanted me to discuss. The first and most interesting one is with respect to the French.

We work very closely with the French, military to military. Sometimes I deal with the Chief of Defense in my SACEUR hat and sometimes I work strictly bilaterally.

FRENCH NUCLEAR FORCES

We meet on a regular basis. It was with respect to the French nuclear forces I wanted to talk to you. There is coordination between us.

Senator WARNER. First, for the record will you give us the composition of those forces?

General ROGERS. First, I should mention that there are three points which are inviolable to the French, [deleted.]

Senator WARNER. [Deleted.]

General ROGERS. [Deleted.]

Senator WARNER. [Deleted.]

General ROGERS. [Deleted.]

Senator WARNER. The composition of those nuclear forces?

General ROGERS. [Deleted.]

Senator WARNER. [Deleted.]

General ROGERS. [Deleted.]

To answer your question in open session about the targeting of the United Kingdom and the French weapons, there is no problem with the United Kingdom because they are committed to me.

[Deleted.]

I said to you in open session that there comes a time when, considering all of the capability from northern Norway around through eastern Turkey one asks how long we can sustain ourselves in a fight conventionally. [Deleted.]

[Deleted.]

That is why it is so important, and I say this publicly, it is so important that I get the support of the Congress to preposition the sets of equipment for divisions five and six.

[Deleted.] The Dutch have spent $50 million buying real estate in that little country for the warehouses for that equipment, which was really a major effort to get them to do. The Belgians have done likewise; and yet each year the Congress inserts language saying—it is not this committee, it is on the appropriations side in both Houses—none of this funding can be spent to ship the equipment for division sets five and six to Europe.

Unless I can get those troops on an aircraft, fly them over to Europe, marry them up with that equipment and get them deployed, I will have no reserve in that [deleted] area.

[Deleted.]

We are modernizing the 8-inch round, but, as I have said earlier today in open session, the bulk of our allied artillery is 155-mm. [Deleted.]

[Deleted.]

I have not received a response on that recommendation of mine but all indications are that that is what will happen. [Deleted.]

I believe that is all I have on my list of items to discuss in closed session.

Senator WARNER. [Deleted.]

General ROGERS. [Deleted.]

Mr. Chairman, I just have to tell you, and I would want to do this in classified session, I face a dilemma. I mentioned earlier in open session how we have developed a new rationale against which we will measure the numbers and types of nuclear warheads we require we now have in the theater 6,000 warheads; that is a lot of warheads.

I won't get the payoff from the new rationale until we submit the next nuclear weapons requirement study which I must forward every year. But tied to those requirements over the years has been the protection of those warheads, the cost of intrusion detection devices, protective wiring and bunkers in our storage sites. There is a whole series of things that all stem from how many nuclear weapons we must have in the theater, both for political and military reasons.

I am hopeful within the next 2 years to be able to pull all of this together and be able to say to the political authorities with high confidence: This is the number of warheads we need, these types, located herein. This number of storage sites, with this many people to secure

and handle them. Hopefully we can get what we are trying to do into a more systematic order.

I say that without criticism of anyone. But it just seems to me that when we first started putting those weapons in Europe we had the philosophy that if one is good, two are better and three then must be outstanding. That comment may be unfair. I do know we had at one time the rationale that we should have "X" number of nuclear warheads for every 155 tube and "Y" for every Lance and "Z" for every 8-inch tube. For me, that is not a proper rationale.

You see, I have asked for the 155 rounds to be modernized; I have asked for the 8-inch rounds to be modernized. And still I haven't yet got my arms around the numbers by types that we need, based on this new rationale in which I have confidence.

I come to you and say this, not knowing but what 3 years from now—2 years from now in my tenure—I will have been asking for things that I don't need on down the road.

On the other hand, if we have to go to war, we don't want to go to war [deleted].

That is my quandry. It is my problem and I have to solve it. I just hope I am not pouring a lot of money down a rathole by requests that I make because we have not yet reached the final decision in confidence on all items which stem from warhead requirements.

You must also understand I must deal with my political authorities with my recommendations to them concerning numbers of weapons, and so forth.

Senator WARNER. Would you suggest some amendment to our procurement process to dovetail with your analysis to save that money?

General ROGERS. That is what we need to work toward. I am not there yet, Mr. Chairman. And yet we don't know how much time we have. Do I in fact have 2 years? Do we have until the end of this decade? I don't know.

One of these days I will have brought all of this together. What I would say to you is I need the 155 round and I would ask that we start producing and procuring the 155 round. [Deleted.]

Senator WARNER. In that sense we wouldn't be putting money down the rathole, to use your words?

General ROGERS. No, not until I get it sorted out. Insofar as the civil engineering and the intrusion and detection system and so on for our sites where we have these warheads stored, I pay for that out of infrastructure funding, common funding from every NATO nation. We went from having very few storage sites to dispersing them up to a [deleted].

I am going to be a smarter man in this area next year than I am now and hopefully have all of this resolved 2 years from now.

Senator WARNER. [Deleted.]

General ROGERS. [Deleted.]

[Deleted.]

Senator WARNER. Bear in mind, gentlemen, we have so many people waiting for the next session.

Senator Exon?

Senator EXON. Thank you, Mr. Chairman.

General Rogers, thank you for coming again. Speaking for myself, there is nobody in the military in whom I have more confidence and

respect, and I have listened very intently to your recommendations this morning.

With regard to the 155 round, do your superiors—you must have told them about this—share your view or is it still up for grabs?

General ROGERS. I believe they finally share my view with respect to need of the 155. [Deleted.] I don't know.

Senator EXON. When I read that article in the paper that you referred to I was looking forward to this this morning so that we could get a firsthand report from you on it. It seemed to me that we should do everything that we can to begin development of what you call a modernized round here to get you up to speed in case you need it.

I, as one member of this committee, will do everything I can to be of assistance to you. There is only so far that we can go here until—may I ask you bluntly, what do the Joint Chiefs think of your proposal?

General ROGERS. I believe the Joint Chiefs are on record as being supportive of modernization of the 155.

Senator EXON. I don't see any basic objection to the outline you have made here. We have to take a risk on a lot of these things and I am ready to take a risk.

If I could digress for just a moment to get your ideas on something else because we count on you to make the decisions over there for the defense of the free world and I think you do an excellent job. I hope that you people in the military recognize the political difficulties we are having right here at home, not just in Europe.

[Deleted.]

ATTACK BY SOVIET FORCES IN THE EUROPEAN THEATER

Let me pose this question to you. How likely do you think an attack by the Soviet forces in the European theater is from what information you have, 1 out of 10, with 1 being low and 10 being high, in the next 2 years? Is that a fair question?

General ROGERS. That is a fair question. I would put my answer this way if I might. I am not concerned about an attack out of the blue from the East, not today.

In the first place, the Soviets are too smart for that. They are watching the same trends that I am watching in Western Europe, such trends that although our forces in Allied Command Europe get stronger every year, the gap between our force capabilities and those of the Warsaw Pact is widening every year.

For example, we field 500 modern tanks one year, they will field 2,000. We will field 400 modern aircraft, they will field 1,000. That gap continues to get wider and wider.

However, the military situation is not unmanageable yet. That is the message I try to give to anybody who will listen to me. The situation is not yet beyond restoration. We are a defensive alliance and we don't have to match them one for one in any category of force comparison. But that trend of the widening gap continues.

There is another trend represented by the attitudes and beliefs of many people on both sides of the Atlantic, but I am particularly concerned with the European side. Their attitudes and beliefs: and I mentioned complacency, wishful thinking, enamored with the freezes, and attracted to neutralism, pacifism, and unilateral disarmament.

These are thoughtful people, well-meaning people. They are casting about for a solution which might prevent war. But what they are doing is counterproductive to the efforts of those of us who are trying to achieve successful arms negotiations and reach arms reduction accords. I happen to believe, Senator, that the path that leads to the future that all of us want—peace with freedom, lowered tensions, and reduced and balanced forces—that path runs through Geneva and Vienna.

The question is—and this is the major menace I see—how long can these two trends continue to converge until we wake up some morning and we find that the Soviets have achieved the objective she has set for herself, which is domination of Western Europe without ever calling her troops out of the barracks. And then we find ourselves politically and economically blackmailed and coerced in Western Europe with the obvious impact in this country. That is the major worry that I have right now, the kind of intimidation that can result from the massive military might of the Soviets from their perceiving us in the alliance as failing to do those things necessary to be politically cohesive, politically unified and militarily strong and resolute, capable of implementing our strategy.

That is why I think these are the two actions that are so important to the alliance.

ESTABLISHING NUCLEAR WEAPON SYSTEMS ON ALLIED SOIL

First in this year our priority must go to putting the new nuclear weapon systems on allied soil by the end of December—barring a breakthrough at Geneva—to show that in fact we can follow through on that very vital decision of December 1979, that our alliance is cohesive and unified, thus providing incentives to the Soviets to negotiate seriously. Second, in the longer term, to be perceived as improving our conventional deterrence which we have been buying on the cheap, doing those things that we need to strengthen ourselves conventionally. Being so perceived will have a favorable impact, I contend, at the MBFR talks in Vienna.

Doing as I suggest it is going to take sacrifice. I have pointed to this Nation with great pride in the past 2 years as setting a model in times of economic constraint of a nation that can and is increasing its security arrangements at the expense of other programs.

I point that out to our European allies because it is a magnificent example our Nation is setting. I point out to our allies that for every dollar we spend on defense in the United States, we spend only $2.50 on social programs. But over there for every dollar our allies spend on defense they spend $7 on social programs.

When allies wring their hands about the possible use of nuclear weapons, one needs to ask them the question: Are you prepared to pay a little more to prevent it? Are you, say, the Belgians, prepared to sacrifice an additional 420 Belgian francs in 1983 for every citizen in order to meet your agreed force goals? Are you each prepared to spend 420 more francs, in 1983 as an additional premium on an insurance policy for peace and freedom?

I remind them that that 420 Belgian francs is less than one-fourth of what they pay as the annual tax for their colored television.

The additional sacrifice varies by nation. It is $38 per citizen in this country in 1983 to meet the force goals established by NATO for the United States. But the average additional sacrifice is only $11 for the citizens in our West European nations. I maintain that added sacrifice is affordable and reasonable. We have to be seen by the Soviets as committing ourselves to that kind of conventional enhancement if we are going to be successful in what I think is the only route to our long-term goal—success at the arms reduction talks.

Senator EXON. My time is up. I want to thank you for the good work and I generally agree with everything you say. I was delighted with the outcome of the German elections, I think many of us were, but I must say to you that I am more worried about the perception that Americans have of this situation right now, even more so than I was before the German elections, on the problems in Europe.

We have problems.

General ROGERS. Yes, sir.

Senator EXON. Thank you.

Senator WARNER. Senator Levin, do you have any further questions?

Senator LEVIN. Thank you, Mr. Chairman.

I am not sure why the Appropriations Committees are always knocking out those pre-position sets five and six. I presume it is somewhat out of pique with our allies for not carrying out their commitments to have 3 percent real growth.

Is that correct?

General ROGERS. I should not speak for the committees, but I believe that is one reason.

The second is not wishing to move equipment from this country to store in Europe when we need it in our Active Army and our Reserves.

When this administration first came into office the only thing I raised with Secretary Weinberger during my initial call on him as SACEUR, was the need for six divisions of equipment pre-positioned in Europe. But I pointed out that all we could stand to pull from the Army Reserves and Active Army were four division sets of equipment. I knew that later as the former Chief of Staff.

If we are to meet our commitment to our allies for a 10 division force in Europe by M plus 10 days, I suggested an additional buy of those two sets of equipment, the sets for divisions five and six.

The Secretary of Defense agreed to that additional buy. Now that the equipment is available and being issued to Conus units it appears that it would have to be pulled from the Reserves and Active Forces again if it were to be stored in Europe.

Senator LEVIN. We bought equipment. The question now is where is it going to be located?

General ROGERS. That is right. I figure I am still owed two sets of equipment which were to be bought over and above the authorized acquisition objective of the U.S. Army.

Senator LEVIN. It is probably a lot more than that, at least that.

General ROGERS. I am sympathetic with the Army, too. I know their problems.

Senator LEVIN. [Deleted.]

FRENCH CONVENTIONAL FORCES

Could you comment on the coordination of conventional forces with the French? Can we count on them?

General ROGERS. Yes, I can. The coordination is extremely good. both multilateral within the NATO context and bilateral. Not only United States and French, but Germans and French and so on; a very close working relationship between the Commander of the U.S. 6th Fleet and Commander of the French fleet in the Mediterannean; a very close relationship between U.S. Army, Europe, and the First French Army. The same is true between the First French Army, most of which is located in Germany, and the NATO CINC, Central Region, General von Senger. The U.S. Air Force has an extremely close association with the French tactical air force.

I am most encouraged by how close that coordination is.

Senator LEVIN. Is that coordination public?

General ROGERS. It is made public to a certain extent. [Deleted.]

Senator LEVIN. I mean in the conventional area, is that generally known publicly? Is that classified?

General ROGERS. It is not classified. Whenever I am asked the question about it, or there is an opportunity to raise this matter, I point out what close cooperation exists. I point out that the common objective between their Chief of Defense and myself—and say so publicly—is to move as far down the road as we possibly can toward having done as much as possible in peacetime so that, when the French political decision is made for their forces to join ours, we lose the least amount of time in utilizing their forces.

Senator LEVIN. In your 2.6 million estimate of uniform personnel did you include the French?

General ROGERS. I did not. I have to go back and look at those figures.

Senator LEVIN. Maybe you can supply those for the record.

[See questions submitted by Senator Levin for the hearing record.]

Senator LEVIN. Mr. Chairman, I will end there and I thank the Chair.

I do have a number of questions for General Rogers, both in open session and in the executive session.

Senator WARNER. Senator Quayle, we are happy to have you.

Senator QUAYLE. You started very early, Mr. Chairman. I have to compliment you on starting at 8 o'clock in the morning.

Senator LEVIN. Don't encourage him.

Senator QUAYLE. I know this is not the first time. It shows the durability of the Chair and the workload on this committee.

TROOPS IN WESTERN EUROPE

General Rogers, there has been a great deal of discussion over a number of years about troops in Western Europe. There has been discussion among Senators about our ratio of Reserves to active duty and how we have 1 to 1.4 active duty, something like that whereas Europe and the other countries have 0.4, 0.3, the obvious reverse.

There seems to be some discussion that we ought to rely more on our Reserves. I brought up the question that if you look at NATO, given the political concerns, and I think a closed session is much better to talk about it than in open session, I hope you can give me as much direction or tell us what kind of communication we really are doing with some of our allies. Serious discussion of this issue is taking place in the political system here, I am not one of those saying that we should withdraw, I am concerned about the amount of sentiment.

U.S. CONTRIBUTION TO NATO

I am also concerned about our contribution to NATO. Are we concerned about this? You talk to other people at your level, do they express the political problem they have? If so, what is the reaction and what direction can we quietly take to perhaps get a reallocation or a change in the mix and attitudes and assumption of responsibility of our NATO allies compared to what we have today?

General ROGERS. The fertile field is mobilization of war reserves and particularly as it relates to the deployment of the Rapid Deployment Force [RDF] and the void that deployment creates in NATO when those same units that are committed to NATO will not be coming to Europe but will go with the RDF.

We are just at the point right now in NATO where we have gotten the information from the United States as to what forces she would expect to deploy with the RDF, and we are now asking our allies how are they going to fill the void?

One approach is through their mobilizable Reserves. Even though they can't create mechanized division or armored divisions, still an infantry division consisting of reserve forces located in the urban sprawl in the Northern Plain of Europe or in the rear area still can be an effective unit.

So, you are pointing toward an area of which I think we must take greater cognizance. The long-term defense program of 1978 called for the creation of 10 additional brigades by our allies. The only ones that have been forthcoming to date are two home defense brigades now committed to NATO by Germany. The Federal Republic of Germany has four more which I expect will be committed sometime in the future. There are many reservists in West Europe because most nations have conscription.

So, our country is using the instrument of the possible deployment of the Rapid Deployment Force to push our allies into doing more than just giving the RDF overflight and base rights and to have allies create forces that will be available to fill the void. To create such forces for that purpose is going to take some sacrifice on the part of the West Europeans, and they will be reluctant to make it.

That is the approach I would take, and it would be under the umbrella of the Rapid Deployment Force.

Senator QUAYLE. What could we do to sort of push that along and to also increase the degree of efficiency of mobilizable Reserves, that is really a key factor. It seems we as a country overlook that or at least not place proper emphasis on it.

Do you think that is true?

General ROGERS. The allies have more Reserves that can be mobilized than we do. I think our country is doing extremely well in the past 3 or 4 years in meeting the levels of Reserve component strength mandated by the Congress, both the Reserves and the National Guard and doing so with good people.

As a nation if you wish to use more Reserves than active troops, the place to use them is in the combat service support [CSS] area. That is what we have done; for example, 67 percent of the combat service support units necessary to support our Active Army Forces are in the Army Reserves.

Now, if you deploy the Rapid Deployment Force, you must send along with the RDF nearly all the CSS units that are earmarked to support not only our forward-deployed forces in Europe—already short 28 percent of CSS—but all the other forces that might come to Europe. The bulk of the Army's CSS units will have to go to Southwest Asia with the RDF.

So there is the place for this Nation to concentrate more on reservists in combat service support units; give them the proper training and get them up to a high level of readiness.

I would not create additional divisions in our Army Reserve; perhaps in the National Guard.

That is the way I would go, both with respect to NATO and here at home.

U.S. STATUS IN GREECE

Senator QUAYLE. Can you give us any update on what is happening in Greece, particularly with the base there? I just happened to stop off there on the way from Lebanon and talked to the base commander there. It is a very tenuous situation.

I have read more statements from Papandreous to the people. I know it is for domestic consumption. Do you think we will get forced out of there?

General ROGERS. [Deleted.]

Senator QUAYLE. [Deleted.]

General ROGERS. [Deleted.]

Senator QUAYLE. There is to them.

General ROGERS. [Deleted.] We depend on Turkey too much to hold that very strategic part of the world and she needs the modern weapon systems with which to do it.

Senator WARNER. I think that is going to be done. [Deleted.] That ratio of $1 U.S. defense—$2½ social programs vice $1 to $7, I was not certain whether that was a reference to certain NATO nations or overall.

General ROGERS. If you take all the Western European nations in NATO, for every dollar for defense they spend $7 for social programs.

Senator WARNER. Thank you, General.

[Whereupon at 10:20 a.m., the subcommittee proceeded in open session.]

[The questions submitted by Senate Armed Services Strategic and Theater Nuclear Force Subcommittee to be answered by General Rogers follow:]

QUESTION SUBMITTED BY SENATOR JOHN W. WARNER, ANSWER SUPPLIED BY GEN. BERNARD W. ROGERS

SOVIET SHORT-RANGE NUCLEAR CAPABILITY

Senator WARNER. How is the overall capability of Soviet shorter-range nuclear-capable systems being affected by the introduction of SS–21's, SS–22's and SS–23's?

General ROGERS. The overall nuclear capabilities of Soviet forces are increasing with the deployment of greater range and more accurate third-generation short-range ballistic missiles (SRBM's)—SS–21, SS–22, and SS–23.

[Deleted.] The SS–21 has a range of 120 kilometers (km) versus a 70-km range for the FROG–7 and the [deleted].

The SS–22 SRBM is believed to be replacing the SS–12 Scaleboard [deleted]. It is projected, however, to replace front and Army level Scud SRBM's. The SS–23 has both improved range and accuracy over the Scud [deleted].

QUESTIONS SUBMITTED BY SENATOR STROM THURMOND, ANSWERS SUPPLIED BY GEN. BERNARD W. ROGERS

DEFENSE POSTURE IN EUROPE

Senator THURMOND. General Rogers, we here on the Armed Services Committee rely very heavily on your judgment and wisdom in regards to our defense posture in Europe.

Would you give us your assessment of the strength of the NATO alliance?

General ROGERS. I believe the alliance is fundamentally sound. As has been pointed out many times before, NATO is a defensive alliance whose first mission is to deter war. In the 34 years since NATO came into existence, not a square meter of allied territory has been lost. So I believe the alliance has been one of history's most significant successes. I do not subscribe to the view that the alliance is in disarray.

At the same time, I am deeply disturbed about the unabated growth of military power of the Soviet Union. This growth has created a serious threat to the alliance. I am concerned that many in the West have not responded to the Soviet threat with the appropriate sense of urgency, as evidenced by, in some cases, reduced defense expenditures and a lack of rapid progress toward improving our defense posture. I am particularly concerned about the widening capabilities gap in conventional forces that exists between NATO and the Warsaw Pact. We need to improve our conventional forces quickly and dramatically, or we face the prospect of political intimidation stemming from overwhelming Russian military power. If enough is not done to beef up NATO conventional forces, the West would have no recourse in war except the early use of nuclear weapons.

PERSHING II FUNDS CANCELLATION

Senator THURMOND. How have our allied military leaders reacted to congressional actions such as cancellation of funds for Pershing II?

General ROGERS. NATO military leaders take great interest in what our Congress does and says, especially regarding issues that bear on the defense of Europe. They find it difficult to understand when the United States makes what are perceived to be abrupt changes in defense policy. Such actions cause confusion and uncertainty, and play into the hands of those who profess to see a weakening of the U.S. commitment to NATO.

RELIANCE ON NUCLEAR WEAPONS

Senator THURMOND. General Rogers, I believe you made reference to our increased reliance on nuclear weapons resulting from failures to meet conventional commitments during your testimony before the House Armed Services Committee. For the record, would you assess the impact of canceling funds for host nation support and POMCUS sets 5 and 6 on our increased reliance on nuclear weapons?

General ROGERS. The impact of canceling funds for German wartime host na-

tion support and for POMCUS sets 5 and 6 would be significant. POMCUS sets 5 and 6 are essential and integral part of long-standing United States and NATO plans to reinforce Europe in order to provide a credible deterrence, or if necessary, adequate combat power in NATO's northern part of the central region to contain a Warsaw Pact attack. Critical to achievement of these goals is the 10 division—D-Day force. The 10 division force is contingent upon six full sets of POMCUS on the ground to complement the four divisions forward deployed. Therefore, lack of POMCUS sets 5 and 6 forward deployed places achievement of those essential goals at risk. How early I must ask for release of nuclear weapons may well be determined by the early availability of the divisions whose equipment would comprise sets 5 and 6. The impact of canceling funding for wartime host nation support is severe, and falls primarily in the area of sustainability. As a result of previous congressional mandates, there is inadequate combat service support force structure forward deployed to sustain U.S. Army Europe's forward deployed, in-place forces. [Deleted.]

The 93,000 German reservists earmarked under full implementation of the wartime host nation support agreement will provide such essential service supoprt as transportation and material handling, airfield damage repair, resupply, medical evacuation, and decontamination. Without this support, the six reinforcing divisions cannot be properly received and appropriately deployed in theater and conventional combat operations cannot be sustained. Taken together, cancellation of funding for POMCUS sets 5 and 6 as well as wartime host nation support would jeopardize successful conventional defense of central Europe, and force early escalation to the use of tactical nuclear weapons.

SAFETY OF NUCLEAR WEAPON STORAGE SITES

Senator THURMOND. General Rogers, I am concerned about the safety of our nuclear weapons storage sites and about the various delivery systems. My specific concern deals with the capabilities of Soviet special purpose forces.

Would you detail for us the threat that these highly trained Soviet troops pose?

General ROGERS. The main intelligence directorate of the Soviet General Staff maintains a large, standing force of elite special purpose (Spetsnaz) forces. [Deleted]. These forces are subordinate to, and tasked directly by, the front intelligence directorate. [Deleted].

QUESTIONS SUBMITTED BY SENATOR HENRY M. JACKSON, ANSWERS SUPPLIED BY GEN. BERNARD W. ROGERS

RELIABILITY OF SOVIET ALLIES

Senator JACKSON. General Rogers, don't you believe that the Soviets increasingly must distrust or doubt the military reliability of their allies—that is, Polish forces and military infrastructure?

General ROGERS. Reliability of the non-Soviet Warsaw Pact forces is a special problem for the U.S.S.R., [deleted]. The main problems contributing to this uncertainty are historical antagonisms, latent nationalism and the adverse impact of the continuing recession on Warsaw Pact economies. [Deleted]. Non-Soviet Warsaw Pact armed forces would almost certainly cooperate and prove reliable in the defense of their own territory. [Deleted.]

Senator JACKSON. Doesn't this doubt increase the deterrence we provide the Soviets?

General ROGERS. [Deleted.] Even though the Soviets have sought to insure unity within the Warsaw Pact through political indoctrination and security programs, traces of doubt obviously remain. These factors probably detract from Soviet leaders' confidence in their allies. In a military sense, the political and economic dissatisfaction and discontent among the U.S.S.R.'s East European allies ultimately could have the effect of weakening loyalty to Soviet military objectives and [deleted].

SOVIET PROBLEMS IN EASTERN EUROPE

Senator JACKSON. Don't we too often ignore the very real military problems the Soviets face in Eastern Europe?

General ROGERS. [Deleted.] Over the past decade the Soviets have concentrated their efforts on correcting military deficiencies in Eastern Europe, and all indications point toward a continuation of this effort.

[Deleted.] The Soviets have also made great strides in quantitative and qualitative improvements in their ground forces in the forward area. Army units are being equipped with the newest models of tanks, the latest artillery weapon systems and multiple rocket launchers. Older missile systems are in the process of being replaced by more sophisticated models. The Soviets are also gradually modernizing East European forces selectively with emphasis on artillery and attack helicopters. [Deleted.]

While the Soviets may harbor some doubts about the genuine enthusiasm some of its East European allies have for membership in the Warsaw Pact [deleted].

QUESTIONS SUBMITTED BY SENATOR SAM NUNN, ANSWERS SUPPLIED BY GEN. BERNARD W. ROGERS

PROBLEMS FACING ALLIED COMMAND EUROPE

Senator NUNN. What is your view of the progress that is occurring in NATO in moving to the deep strike/second echelon attack capability that you have endorsed? What doctrinal problems still exist, if any?

General ROGERS. Allied Command Europe (ACE) is developing procedures for attacking follow-on forces. The Major Subordinate Commanders in ACE are playing a key role in this process. As for the NATO countries, some such as Germany, are vigorously working toward developing and fielding the capability to strike follow-on forces. Others have been more cautious in their approach to the issue and are still examining the problem, in large part because of budgetary reasons. As for the doctrinal issues involved, Allied Command Europe is addressing these as it develops procedures for attacking follow-on forces. In the process the views of the various nations will be taken into account. The result of efforts to date indicate that no major doctrinal issues need emerge, since what is being done is fully supportive of the flexible response strategy and the forward defense concept. Any major future impediments to implementation of attack of follow-on forces are not likely to be doctrinal, but rather hardware problems. Developing adequate target acquisition means and weapons with requisite range/accuracy/responsiveness are the real challenges, both for the United States and its allies.

Senator NUNN. How do you answer the critics of this concept? What problems are in the U.S. budget to fulfill this requirement and what programmatic initiatives are needed? What opportunities exist for NATO cooperative programs in this area?

General ROGERS. As for the first question, it makes little sense to allow Warsaw Pact follow-on formations to supply and close rapidly on NATO defenses without being disrupted and attritted enroute. By directing some of our force against these deeper targets, we can slow the rate of advance and reduce the volume and rate of presentation at the forward edge of the battlefield. Moving Warsaw Pact formations present lucrative targets against which weapon effectiveness can be maximized. Attacking follow-on forces also introduces a confusion factor that will disrupt the orderly battle plan that the Warsaw Pact would like to execute. As for the second and third quesiton, there are four elements, all of which must function successfully to attack the follow-on forces. The first element is target location.

[Deleted.] The second element required is secure, survivable communication systems to transmit the information detected by sensor systems to intelligence processing centers. [Deleted.] The third element required is a fusion system which can rapidly process the sensor data and transmit, in real time, targeting information to the appropriate attack systems. [Deleted.] To send aircraft deep into enemy territory to attack a moving target based on information that is more than several hours old is a less than optimal proposition. The final element required is an accurate, survivable attack means. Today, attack of a deep target requires an aircraft in most cases. In the future, we need a standoff capability that will allow these targets to be attacked without necessarily having a manned aircraft overfly the target area. As for cooperative programs within NATO, we have had some success with both the F–16 and AWACS. The number of opportunities available in the future will to a great extent depend on the willingness of

the countries involved to share their technological developments since many of the systems needed will be based on new technology.

AIRLAND BATTLE CONCEPT

Senator NUNN. What is your view of the AirLand Battle concept, and how do you plan to implement this in NATO?

General ROGERS. It must be kept in mind that the AirLand Battle doctrine is a U.S. Army doctrine based on a global perspective. The AirLand Battle doctrine should not be confused with the U.S. Army's AirLand Battle 2000 concept that deals with potential developments and capabilities in the year 2000.

When we developed the ACE concept for the attack of Warsaw Pact follow-on forces, the SHAPE staff analyzed the efforts of nations in this field, including the U.S. Army's AirLand battle doctrine. The ACE concept, approved by me in June 1981, incorporated those elements from all the nations' (and subordinaate commands') thinking which were most applicable for ACE. There are some aspects of the U.S. Army's doctrine, developed for global applicationing which are not appropriate for the defensive posture of ACE.

Senator NUNN. What is the current capability in the intelligence area needed to implement the AirLand Battle concept, what are the problem areas, and what programmatic initiatives are needed? What problems, if any, exist in the intelligence fusion area?

General ROGERS. From an intelligence perspective, the ACE concept for attacking Pact follow-on forces, requires the integration of intelligence collection, communications, data processing, and dissemination to a degree that was not even conceivable a few years ago. Because we can expect to face a numerically superior force in Europe, we must have the capability to track, identify and target our adversary over an extended battlefield. To accomplish these goals, continued programmatic support for collection systems capable of monitoring the extended battlefield is essential. In this area we have made substantial progress. The TR–1, with its [deleted] imaging radar systems, will provide a significant capability for day-night, all-weather monitoring of first and second echelon forces. JSTARS, with its moving target tracking capability, will provide the timely and accurate positional data needed to employ effectively our present and planned extended-range weapons systems. Continued improvement and developmemnt of satellite-based collection systems with the capability to disseminate information rapidly to operational commanders will support critically needed monitoring of follow-on forces. With all of these systems, programmatic support for development of day-night, all-weather collection capabilities is mandatory. Collection, however, is only part of the equation. The amount of data that current and future collections systems will provide to operational commanders can be a detriment without the ability to fuse this data rapidly into a coherent stream of usable information. Intelligence fusion presents our greatest challenge and we are making progress in this area.

[Deleted.]

LONG-TERM DEFENSE PLAN

Senator NUNN. How well is NATO doing implementing the long-term defense plan and what is your view on how United States can, if needed, revitalize this effort?

General ROGERS. I believe the LTDP has led to considerable improvement in NATO's defense posture. [Deleted.] So there has been progress.

As you may know, the LTDP as a separate program has been phased out. Many of its principles have been incorporated in other planning processes, such as Force Goals. It is important that NATO build on the progress that we made under LTDP. We need to ensure that the analytical advantages the LTDP brought to the planning process are not lost in the transition. We also must continue to point out, as Secretary Weinberger and others have been doing, that many of the actions begun under LTDP have not been completed. [Deleted.]

CONVENTIONAL PREPARATIONS

Senator NUNN. What is the current capability of the United States and our allies to support the type of conventional conflict envisioned for NATO center? What are our objectives in terms of ammunition and war reserves and what do we currently have? What is in the 5-year plan and what are the major deficien-

cies? What is the current objective of our NATO allies and what is the current level on hand?

What is your view of the recent proposal of former Secretary of Defense McNamara and others that the United States cut our procurement of ammunition and war stores for NATO since we are so far in front of our allies?

General ROGERS. The NATO minimum stockage objective for war reserves is 30 days with the exception of the U.S. The NATO recognized U.S. stockage objective is [deleted] as our forces must be sustained until the transAtlantic LOC is established. DOD resource planning guidance has supported the [deleted]. The services have attempted to comply with the Defense Guidance. With the exception of Army class VII and some high technology missiles, the service POMs for FY 84–88 would satisfy [deleted] of U.S. European Forces war reserve requirements if fully funded/implemented. As you are aware, there is a tendency to place the bulk of funds needed to correct a given problem in the program outyears. Thus, while we have gradually improved our theater war reserve status, full realization of the [deleted] level has remained perpetually five years in the future. USCINCEUR has no access to specific status of Allied efforts to achieve war reserve objectives; however, unclassified sources reveal varying degrees of success depending on the commodity and nation concerned. All free-world western nations are currently experiencing some degree of economic stagnation or depression making real growth in defense spending a difficult and often politically unpopular choice. It is especially important during these economically troubled times, that the United States maintain the goals we are encouraging our allies to achieve. To cut back on our procurement of war reserve materiel now, particularly ammunition and critical items for U.S. European Forces, would be self-deluding, dictate early resort to nuclear weapons in any major conflict and send the wrong signal to both our allies and potential adversaries.

FORWARD DEFENSE CONCEPT

Senator NUNN. In the recent issue of Army magazine, First Lieutenant Peters wrote a very thoughtful and provocative article on the forward defense concept. Would you have your staff comment on this article both from a political perspective but primarily from a military capability standpoint?

General ROGERS. Lieutenant Peters' article is a well-written exposition of current discussions concerning implementation of the NATO Forward Defense concept, and he makes several valid points. However, he incorrectly suggests that Forward Defense is directed toward defending a small strip of NATO territory, whereas, in fact, NATO is seeking the flexibility to carry the war to the enemy's rear by attacking reinforcing units before they trespass NATO territory. Forward Defense thus remains a valid principle and I support it. Our commitment to Forward Defense can best be implemented, in my view, once NATO is attacked, by carrying the battle forward—to the enemy's own territory. We continue, as you know to evaluate improved methods for stopping and punishing an aggressor as deeply in his territory as possible in order to preserve the credibility of Forward Defense.

TECHNOLOGY TRANSFER PROBLEMS

Senator NUNN. Are there any short-term legislative initiatives that can be taken to address technology transfer problems that we are all concerned about?

General ROGERS. I would be pleased to see you take any legislative or other measures that would make it more difficult for the Warsaw Pact to acquire critical Western military-relevant technologies. Protection of our technological lead for national security should continue to be a matter of real concern to the Congress as it is to the U.S. military. I do not have specific legislative initiatives in mind. I certainly do not underestimate the difficulty involved in legislating control measures over technology transfer, but I do endorse efforts to deal with this important matter.

Senator NUNN. [Deleted.]

General ROGERS. [Deleted.]

SOVIET-WARSAW PACT WEAKNESSES

Senator NUNN. What is your view of a principle of military strategy that would envision exploiting inherent Soviet-Warsaw Pact weaknesses? I have in mind the tenuous land lines of communication, the "unreliability" of the Pact

Allies, and the lack of ready ocean access. What is your view on whether or not the Soviets should enjoy a sanctuary in Eastern Europe?

General ROGERS. Any sound military strategy must be aimed at exploiting an adversary's weak points. Interrupting Warsaw Pact lines of communication and taking the war to the Warsaw Pact are part of the rationale for attacking the follow-on forces. As for an Eastern European sanctuary, I do not feel NATO can afford such a luxury. If the Warsaw Pact should attack, NATO must disrupt the flow of supplies and reinforcements while they are still in the Eastern bloc territory.

SPECIAL OPERATIONS FORCES

Senator NUNN. What is your view on the need to improve the special operations forces that would have the capability to disrupt Soviet military activity?

General ROGERS. Improvement of Special Operations Forces is important to the successful containment of Soviet/Warsaw Pact aggression. Three major areas need attention. First the forces. We presently have [deleted] allocated to USEUCOM for planning. [Deleted] and may not be available. We require a [deleted] to fulfill adequately mission requirements. There are [deleted] which limits them to replacement and follow-on requirements. Secondly, [deleted] USEUCOM requirements were established in July 1979, and have been revalidated annually. [Deleted] Currently there are [deleted] and [deleted] for planning purposes. These [deleted] Third, to exploit fully the potential of Special Operation Forces requires dependable communications. Communication systems currently fielded do not include state-of-the-art technology required in the high threat Soviet environment. Increased funding and support of Special Operations Communications/Electronics research and development and procurement efforts are urgently required.

1975 NUNN AMENDMENT

Senator NUNN. What has happened with U.S. forces in NATO since the implementation of the Nunn "tooth-to-tail" amendment in 1975? (This amendment required the reduction of 30,000 support troops with a permissive add-back of 20,000 combat troops.) What is the current U.S. combat to support ratio and how has this changed in the last 5 years? What are the projections for the next 5 years?

General ROGERS. At the time of the Nunn amendment of 1975, you stated that the combat to support ratio was 49/51, according to your figures. Similarly, your figures showed that this ratio remained fairly constant at about 52/48 during the period 1976–1980. The Department of the Army, however, computed the ratio as 62/38 during 1976–1980, with the difference being the method of computation. You counted combat support (CS) forces such as artillery, signal, engineers and military police as "providers of combat support" rather than "consumers of logistic support" as viewed by DA and USAREUR. [Deleted.]

By 1982, the ratio was 62/38 (source; your report on this matter). The current ratio as reported to Department of the Army in the USAREUR Essential Force Package Report is 67/33. By Army doctrine, the optimal ratio is 53/47. The USAREUR goal is leaner than that, with the objective in the next five years being 58/42. It is difficult to predict how closely this goal will be met as we are still working with the European troop strength ceiling problem, and this ceiling will have an impact on the final ratio. I remain concerned, however, that we may have reduced too much "tail." In addition to known CSS shortfalls in the Central Region, we currently lack the ability to support U.S. divisions committed to the NATO flanks. USCINCCENT shares similar concerns, as we double-count many of the same CONUS-based active and reserve component forces for support of our respective theaters. This issue demands a reevaluation.

WARTIME HOST NATION SUPPORT

Senator NUNN. How important is the Wartime Host Nation Support with the Federal Republic of Germany and what would U.S. requirements be without this? Is this type of agreement compatible with the views of some that our allies should shoulder a greater portion of the burden of common defense?

General ROGERS. Wartime Host Nation Support (WHNS) from the Federal Republic of Germany is essential for the United States to reinforce NATO rapidly and effectively with sustainable combat forces. U.S. combat forces cur-

rently allocated to the European theater lack the logistics support structure needed to conduct sustained wartime operations. Without WHNS from Germany the U.S. would have to forward deploy additional active CS/CSS units and equipment to achieve comparably responsive support for the deploying combat divisions and associated Air Force units. In order to sustain the planned U.S. 10-Division D-Day forces the FRG has agreed to provide 93,000 Reservists plus an estimated equivalent of 100,000 civilian labor spaces. Use of U.S. reserve or active duty support troops would be at 10 to 40 times the cost of the German WHNS alternative. WHNS from Germany is a classic example of a U.S. ally assuming greater share of the common defense burden. Traditionally within NATO this logistical support has been considered a national responsibility. The U.S.-GE WHNS agreement represents a major breakthrough because, for the first time, a NATO ally has agreed to pay a portion of support costs for U.S. combat units. In summary, WHNS is critically needed and cost effective for sustainment of U.S. combat forces, while enhancing the credibility of the forward conventional defense of NATO.

Questions Submitted by Senator Carl Levin, Answers Supplied by Gen. Bernard W. Rogers

THEATER NUCLEAR FORCES

Senator Levin. General Rogers, you have said a new rationale has been developed for determining the needs for short-range nuclear systems—the modernization of which you support.

You also have said that the short-range balance now also has shifted against us with their 152-millimeter artillery becoming nuclear capable. You said that you do not yet know how the new rationale will be translated into specific warhead requirements in your annual requirements study.

How has this rationale for need/use of short-range systems changed? Is it just for short-range or all systems?

General Rogers. In the past, requirements were developed to attack each Forward Division, plus those of the follow-on Armies. Currently we are not developing requirements against each and every WP Division facing ACE. Rather we now allocate capabilities to various ACE command levels to hold elements of the WP at risk. Through assessment of the threat and the expected deployment against the three regions, force requirements are developed for [deleted]. The purpose of allocating ACE resources within sectors and regions is to give flexibility at these levels to react to major threats which exceed the capability of a particular corps and/or sector. This approach provides requirements against [deleted] targets at both short and medium ranges, to include artillery weapon systems, surface-to-surface missiles and aircraft. Another major category, [deleted] includes targets for attack with medium and long range weapon systems.

SHORT-RANGE NUCLEAR WARHEADS IN EUROPE

Senator Levin. Do you expect this changed rationale to increase or decrease our requirements for short-range nuclear warheads in Europe?

General Rogers. The requirements study is not complete. Until the study is completed and has been thoroughly reviewed, I consider it premature to provide an answer. Further, I do not want to interfere nor preempt the ongoing work of NATO's High Level Group which is developing a study to determine essential requirements for those NATO nuclear forces with range capabilities less than Long-Range Intermediate Nuclear Forces. The results of the High Level Group study will be presented to NATO Ministers of Defense this fall.

MODERNIZATION OF THE 155MM SHELL

Senator Levin. Why should we approve modernization of the 155-millimeter shell, which Congress rejected last year, until you translate your new rationale into requirements in your anual needs statement? Shouldn't Congress know the overall scope in numbers and total program cost before we begin this program?

General ROGERS. Modernization with the 155mm shell is a significant part of the theater's nuclear modernization program. At present, 155 howitzers comprise the majority of nuclear artillery units in theater. [Deleted]. The new 155mm warhead is being designed with required state-of-art safety and security features and will provide increased accuracy, range, and effectiveness. As I indicated earlier, the results of our requirements study and the HLG effort should provide numbers of 155mm nuclear weapons needed to determine final production funding. However, funding support is required now to continue development of the new warhead.

MODERNIZATION OF SHORT-RANGE SYSTEMS

Senator LEVIN. Even though you support modernization of our short-range systems, it sounds like NATO parliamentarians will be ambivalent about it; according to the Washington Post on March 15, 1983. They want large reductions of present short-range systems. Has the North Atlantic Assembly, the NATO Parliamentary group, endorsed modernization of our short-range nuclear weapons?

General ROGERS. In 1978 SACEUR developed proposals to improve theater nuclear forces. Included in this was a proposal to develop, produce, and deploy new technology warheads for short-range nuclear systems. These proposals were supported and endorsed by NATO Defense Ministers of the Nuclear Planning Group. The proposal to modernize short-range nuclear weapons has subsequently been included in NATO's Force Goals which are a product of NATO's Defense Planning Committee (DPC). Future short-range nuclear weapons are under review by the High Level Group and results will be presented to the Defense Ministers of NATO's Nuclear Planning Group this fall. This effort is providing the basis for full alliance participation in developing short-range nuclear requirements at the government level. As far as is known, the inter-parliamentary group of the North Atlantic Assembly has not addressed the modernization of our short-range nuclear weapons. They have however, endorsed the ongoing review of shorter range nuclear weapons aimed at rationalization of essential requirements of short-range nuclear forces.

Senator LEVIN. You say the short-range launcher balance has shifted from about three to one for us to against us with conversion of the many 152-millimeter artillery tubes to dual mission and conversion capability. Do we know whether they have the nuclear shells—enough of them—to use this edge effectively? Do they have the trained crews for this yet? How meaningful is this edge then?

General ROGERS. The 152-mm howitzer equipped with dual mission artillery tubes is organic to Soviet armies [deleted].

SHORT-RANGE NUCLEAR WEAPONS

Senator LEVIN. General, there are reports the Pentagon is reassessing the need for the thousands of short-range nuclear weapons we currently have deployed in Europe, supposedly because their yields are too large, their ranges are too short, their accuracies too poor and their storage sites too vulnerable. All this degrades their deterrent utility.

Do you agree that we should reduce the numbers of these warheads?

General ROGERS. NATO is continously reviewing its requirement for nuclear weapons. Although current short-range artillery fired atomic projectiles are aging, they still serve as a viable deterrent. We may be able to reduce the numbers of short-range weapons as advanced technology weapons are introduced. However, requirements must be based on the threat, which is continuously changing, as well as weapon capabilities. That is why the subject remains under continuous review.

Senator LEVIN. Reportedly, some people in the Pentagon also are considering that we should not produce new nuclear artillery shells, [deleted]. You yourself said that modernizing our chemical warfare capabilities was more important to you than deploying neutron warheads.

Considering the political problems facing the alliance with the GLCM/PII deployments this year, why should Congress approve any neutron warhead funding and thereby add to the burden on the political and military cohesion of NATO?

General ROGERS. We need new, modern nuclear weapons; [deleted]. Due to [deleted] production rates, we need funding now in order to have [deleted].

Regarding my earlier comments on chemical weapons, the primary purpose of nuclear and chemical retaliatory capabilities is, respectively, to deter enemy nuclear and chemical attack and, failing that, to provide an effective response. Our present short-range tactical nuclear capability addresses this; however, we lack a credible chemical retaliatory capability, which has the potential for [deleted] military consequences.

NEUTRON ARTILLERY SHELLS

Senator LEVIN. Even though neutron artillery shells will have longer ranges than current shells, they still will be of extremely short range. And although blast and thermal effects are reduced, they are not eliminated, so there still will be collateral damage from their use, albeit less. Won't these neutron shells have some similar deficiencies to those which NATO politicians are arguing are reasons we should reduce our nuclear stockpile in Europe?

General ROGERS. The Reduced Blast/Enhanced Radiation (RB/ER) weapon, has as its central purpose the deterrence of Soviet-Warsaw Pact aggression. For deterrence to be credible, NATO needs a full spectrum of military capabilities. Should deterrence fail the RB/ER would significantly improve our ability to support the forward conventional defense. The RB/ER warhead is an efficient, qualitative improvement that helps offset Warsaw Pact numerical superiority in tanks and other armored vehicles through emphasis of radiation over blast as the damage mechanism. Another important advantage of radiation versus blast is use of lower yield weapons, thereby limiting collateral damage. Our fighting forces as well as neutral or friendly population could be protected by more precise and confined damage effects resulting from these improved warheads. In my view, the RB/ER warhead can make a significant contribution to help offset increasing Soviet military strength.

Senator LEVIN. Of what real utility is it to build neutron warheads and stockpile them in this nation—does that really add anything to our nuclear deterrent in Europe?

Isn't that the worst of both worlds: They cannot contribute to our deterrent over in Europe and their potential deployment causes us political problems in NATO?

General ROGERS. [Deleted.] The fact that ER/RB weapons exist is a factor the Soviets must consider, regardless of location. Therefore, these weapons must be considered additive to NATO's deterrent equation.

Senator LEVIN. Wouldn't it make more sense not to build any of these artillery shells until NATO gets the INF deployments out of the way and sorts out its policy toward all battlefield weapons?

General ROGERS. All studies of theater nuclear requirements continue to reaffirm the Alliance's need for short-range systems. However, currently deployed short-range artillery fired atomic projectiles are old, [deleted] and therefore [deleted] degrade NATO deterrent posture. In the SNF area I do not want the Alliance put in a position similar to our LRINF situation (i.e., Soviet/WP—SS–20's; Alliance—nothing). I am particularly concerned in view of recent Soviet developments in their SNF.

NEUTRON WARHEAD PROTECTION

Senator LEVIN. Wouldn't neutron warhead production hand another propaganda victory to the Soviets when we can least afford it among the populations of Europe?

General ROGERS. I believe the enhanced radiation warhead, with its increased effectiveness serves as a greater deterrent to war. However, as I have stated, we are taking a hard look at nuclear requirements and how these requirements can best be met, just as we are looking seriously for ways to improve NATO's conventional capabilities. Both types of forces—modernized and ready—are essential to the maintenance of NATO's deterrent posture. When the neutron weapon is produced, undoubtedly the Soviets will maximize their propaganda efforts, as they have attempted to do with INF. We cannot, however, have Soviet propaganda determine our NATO defense needs.

INF

Senator LEVIN. General Rogers, there is a general impression in the United States that none of our European allies really are willing to accept the GLCM and Pershing II deployments, but that we are somehow forcing these deployments on them. How would you respond to this contention?

General ROGERS. Although a segment of the European public is speaking out against deployment, Alliance governments are holding firm to their 1979 decision. The decision was unanimous to deploy GLCM and Pershing II to counter Soviet weapons programs and strengthen stability and Western security. NATO's agreement to a two part strategy of deployment and arms control talks was a reflection of Alliance resolve to restore a European nuclear balance at lower levels of armaments. This resolve has been reconfirmed repeatedly, with most recent reconfirmation occurring in March at the NATO Ministers' Nuclear Planning Group meeting in Portugal.

NEED FOR M–1 TANK

Senator LEVIN. General Rogers, last year, you said the following about the capabilities of the M–1 tank and its production rates:

"In the field of equipment I am pleased with actions which will hasten the delivery of modern weapons, such as the M–1 tank, to Europe.

"A delay in production and fielding of the M–1 tank would unquestionably reduce our capability to defend NATO Europe against Soviet aggression.

"The M–1 is currently the best tank on the battlefield, and product improvement programs will continue. The M–1 incorporates major improvements in: Crew protection, speed, battlefield agility, lethality, and fire control reliability. These improvements provide for greater survivability which allows us to defend more effectively for a longer period of time. To delay this capability, while the forces opposite NATO continue to be modernized, is not in our best interests and would adversely impact on our ability to defend NATO Europe."

This administration now proposes to reduce the production rate of M–1s from 855 in fiscal year 1983 to 720 per year in fiscal year 1984 and thereafter. This cuts some 360 tanks from past projections for fiscal year 1984 and fiscal year 1985 and beyond. It also delays by several years the Army's achievement of its 7,058 M–1 inventory objectives.

Would you still say such reductions "are not in our best interests and would adversely impact on our ability to defend NATO Europe?"

General ROGERS. Fielding the M–1 tank is an integral step in our overall Army modernization program for all the reasons enunciated in last year's testimony and restated in the preamble to your question. A delay in production and fielding of the M–1 will delay our achieving our planned capability to defend NATO Europe.

Senator LEVIN. Of all the U.S. services, would you agree the Army needs the most modernization and has lagged behind the Air Force and Navy in modernizing against the Soviet threat? The delays in the M–1 annual production are even doubly unwise, are they not?

General ROGERS. Soviet modernization efforts show no sign of abating and reach across the spectrum of modern weapons for all services. U.S. and allied efforts are required on all fronts if this unrelenting Soviet effort is to be countered successfully. Essential modernization to respond to Soviet advances is a major USEUCOM priority. Pressing modernization needs for USEUCOM include better capability to target and destroy enemy forces; improved capability for engaging Warsaw Pact follow-on forces; survivable, secure voice/data and interoperable theatre and tactical command, control and communications systems; improved air defense coverage, and improved anti-armor capability. HQ/USEUCOM FY82 input for the FY84–88 Joint Program Assessment Memorandum (JPAM), highlighted delays in M–1 tank production, Copperhead procurement, AH–64 R&D, and AH–1 COBRA TOW sight as inconsistent with the priority anti-armor capability requires. While the continued Soviet build-up dictates we can not afford to be complacent and I consider our tank modernization effort vital, this effort must be viewed in the context of a balanced program designed to counter the total Warsaw Pact effort.

DEFENDING EUROPE WITH CONVENTIONAL WEAPONS

Senator LEVIN. General Rogers, you have said you share the optimism of General Frederick Kroesen, U.S. Army Comander in Europe, that he could

successfully defend Central Europe with conventional weapons. However, you say your pessimism about the need to go nuclear "fairly early" because of a weakness in our conventional NATO defenses is based, in part, on the lack of sustainability of our allies. You implied that General Kroesen's optimism was based on the fact he was considering only the capabilities of U.S. troops, not the allies, also.

According to the interview which quoted General Kroesen, he also was considering the capabilities of the West Germans and Canadians who share with the United States the responsibilities for defending Central Europe. Please explain this apparent contradiction with your statement.

General ROGERS. General Kroesen and I are in complete agreement regarding NATO defense capabilities in Central Europe. I believe you will find his optimism always expressed in terms of initiating the defense and coupled with concerns about sustaining the defense if we do not build up our conventional capability. In his NATO role as Commander, Central Army Group (CENTAG), General Kroesen commands NATO's land forces in Southern Germany. CENTAG includes United States, German and Canadian units. Additionally, if the French were to join in wartime defense, their forward ground forces, The First French Army, would likely operate with CENTAG. CENTAG units have a higher proportion of regular soldiers than those of Northern Army Group (NORTHAG) in Northern Germany. Importantly, CENTAG has stores of pre-positioned supplies which would probably enable CENTAG units to sustain the defense using conventional weapons for longer than NORTHAG. NORTHAG is composed of German, British, Dutch, Belgian and some U.S. units. Many NORTHAG units are malpositioned, making initial movement to fighting positions more difficult, and a high percentage of NORTHAG's troops are reserves. NORTHAG has serious shortages of pre-positioned supplies. It is the lack of sustainment which will cause me, under current conditions, to request the release of nuclear weapons fairly early.

General Kroesen is properly proud of CENTAG's capabilities; but as SACEUR I am charged with the defense of all of Allied Command Europe.

FRANCE AND NATO

Senator LEVIN. [Deleted.]

General ROGERS. France is committed to the Atlantic Alliance; however, French policy precludes the prior commitment of French Forces to the NATO integrated military command. [Deleted.]

Senator LEVIN. [Deleted.]

General ROGERS. The French have displayed a keen interest in furthering peacetime coordination between their forces and other NATO conventional forces. [Deleted.] They maintain formal liaison missions to major NATO military headquarters, such as SHAPE, AFCENT and AFSOUTH. Despite this fairly high degree of peacetime defense interrelationship and cooperation, [deleted]. This French policy, I should add, does not preclude the strong positive military dialogue which continues to exist between France and the military establishments of the United States and other NATO countries.

Senator LEVIN. [Deleted.]

General ROGERS. [Deleted.]

Senator LEVIN. [Deleted.]

General ROGERS. As I mentioned, I personally believe that the French will support NATO in event of war and very likely will join her forces with those of NATO to defend Western Europe. [Deleted.]

Senator LEVIN. [Deleted.]

General ROGERS. [Deleted.] However, as stated, I personally believe that the French will support NATO in event of war; [deleted].

WESTERN EUROPEAN SACRIFICES LAGGING

Senator LEVIN. General Rogers, last year you told this subcommittee that it was necessary for the United States to continue to support increased defense budgets so as to set an example our European allies would follow in increasing their own defense contributions: You said this about the pending congressional consideration of the fiscal year 1983 defense budget?

"If that message continues to come through from the leader of the alliance, then we have an opportunity to have the citizens of Western Europe understand the threat and be prepared to follow our example to make sacrifices and send that message to their elected representatives."

General, in the past several years the U.S. has increased the defense budget in real terms by the following amounts, based on the NATO definition of defense spending: Fiscal year 1979—3.4 percent; fiscal year 1980—4.9 percent; fiscal year 1981—5.4 percent, Updated figures for fiscal year 1982 and fiscal year 1983 of U.S. Defense spending based on the NATO definition are not available yet, but in terms of outlays, our own defense budget, according to CBO calculations grew by 7.7 percent in fiscal year 1983. Our defense budget has thus been growing significantly in real terms each year.

On the other hand, the weighted average real growth rate in defense spending of all our allies was projected to be the lowest it has ever been in 1982 (latest available)—between 1.0 percent and 2.1 percent, according to DOD. We have set the example you called for.

Why do you think the Europeans have failed to follow?

General ROGERS. Economic and political conditions in nations have certainly made it difficult for some of the Allies to follow the U.S. example. Beyond that, however, I continue to believe that the people of the Alliance must be accurately informed about the nature and the magnitude of the threat that the Warsaw Pact poses to their free and democratic societies. If this can be done, public opinion will demand that governments take the necessary actions to shore up defenses. In this context, then, it is a matter of education. In my opinion, some European leaders could be doing more in that regard.

Senator LEVIN. General, you have called for 4 percent annual real growth by each NATO nation. Why do you think they will be willing to spend that much if they don't even meet the three percent commitment?

General ROGERS. It is my view that, for NATO as a whole, an annual real increase of about four percent is needed if the Alliance is to fulfill its 1983–88 Force Goals. That is an average for all NATO nations if the Force Goals are fully met; being an average, the percentage real increase per nation varies. If the people of our nations realize that for 1983 that real increase amounts to an average additional sacrifice of only $23 for every citizen in the Alliance (only $11 for each citizen in W. European allied nations) I believe they would consider such a sum reasonable and affordable, and a small added premium on an insurance policy for peace with freedom. Our challenge is getting the message across to the people on both sides of the Atlantic.

OPEN SESSION

The subcommittee proceeded in open session at 10:20 a.m., in room SR–222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Present: Senators Warner, Jackson, Exon, and Levin.

Staff present: Frank J. Gaffney, professional staff member; James G. Roche, minority staff director; Paul C. Besozzi, minority counsel, and Willis D. Smith, deputy staff director and chief scientist for the minority, David S. Lyles, Patrick L. Renehan, and James C. Smith, professional staff members; and Karen A. Love, staff assistant.

Also present: John Campbell, assistant to Senator Warner; Jim Dykstra, assistant to Senator Cohen; Hank Steenstra, assistant to Senator Quayle; Arnold Punaro, assistant to Senator Nunn; Greg Pallas, assistant to Senator Exon, and Peter Lennon, assistant to Senator Levin.

Senator WARNER. The committee will resume in open session.

Mr. Richard Perle, Assistant Secretary of Defense for International Security Policy, Dr. Richard L. Wagner, Assistant to the Secretary of Defense for Atomic Energy, and representatives of the Office of the Secretary of Defense, will provide their views on matters of nuclear warfare from their perspective as it relates to the authorization of defense spending before this subcommittee.

Secretary Perle and Dr. Wagner will concern themselves with policies and programs complemented by input from the representative of the three Services—General Watson, U.S. Army, Director, Nuclear and Chemical Directorate; Admiral Holland, U.S. Navy, Director, Strategic and Theater Nuclear Warfare Division, Office of the Chief of Naval Operations, and General Callaghan, U.S. Air Force, Deputy Director, Regional Plans and Policy DCS/Plans and Operations.

We will now hear from Secretary Perle.

STATEMENT OF HON. RICHARD PERLE, ASSISTANT SECRETARY OF DEFENSE (INTERNATIONAL SECURITY POLICY)

Mr. PERLE. Thank you very much, Mr. Chairman.

Senator WARNER. First, I would like to apologize for any inconvenience that the subcommittee may have caused the witnesses today, but obviously we were in session with General Rogers and more time was consumed than anticipated.

Mr. PERLE. I expect he had some interesting things to say.

With your permission, I would like to make available for the record a prepared statement and focus my comments this morning on three things.

One is our intermediate nuclear forces, both the administration program and the negotiations presently underway in Geneva; second, on shorter range nuclear forces; and finally on the question of the nuclear freeze.

The nuclear freeze would entail a freeze affecting intermediate range forces and indeed others. I have brought some charts with me this morning that provide some detailed information on the effect of a freeze on the United States and Soviet strategic inventories.

With your permission, I would like to take a moment of the subcommittee's time to address that issue.

MODERNIZATION OF NONSTRATEGIC NUCLEAR FORCES

First, with respect to the administration's program for the modernization of nonstrategic nuclear forces, let me say that it does not entail a quantitative increase in the number of these weapons. Indeed the trend of recent years has been a quantitative decrease.

I would remind the subcommittee that in December 1979 in connection with the decision to deploy the Pershing II and ground-launched cruise missiles in Europe, the United States unilaterally withdrew the thousand short-range nuclear warheads from the European theater.

Also in December 1979 the alliance as a whole pledged that the introduction of the 572 Pershing and ground-launched cruise missiles would not result in a net increase in the number of nuclear weapons deployed in Europe. We therefore planned to remove weapons on a one-for-one basis as those modernized nuclear forces are deployed in Europe.

Therefore, it is easy to summarize the thrust of the administration's request this year with respect to nuclear weapons of less than strategic range. We ask to be permitted to proceed with the normal sort

of modernization that inevitably becomes necessary as aging weapons become increasingly less effective.

That is the situation we now face with respect to Lance, the 8-inch shell, and the 155mm projectile, and we therefore propose to modernize with respect to each of these systems in order to provide improved operating characteristics and indeed improved safety.

I believe these programs should be relatively noncontroversial. Unless there are specific questions, I won't say more than that the thrust of this program represents a normal sort of technological modernization.

If I may say a word about the negotiations presently underway in Geneva.

As you know, Mr. Chairman, in October 1981 President Reagan proposed to the Soviet Union—and it has been our position since that time that we eliminate the entire category of weapons that is the subject of negotiation in Geneva—that is, the longer range land-based intermediate nuclear forces on both sides.

Those forces consist on the Soviet side of the SS–20 missiles which they have been deploying at the rate of one a week during the whole of the period we have been negotiating, and indeed before that, and all SS–4 and SS–5 missiles which the Soviets have repeatedly said would be withdrawn as their newer SS–20's were deployed.

On the American side, the western side, we envisage deployment of a limited number of Pershing II missiles—108—replacing Pershing I's that are presently deployed and the deployment of some 464 ground-launched cruise missiles. The deployment of both of these systems is to be spread over five allied countries.

This deployment arises out of a decision reached after very considerable debate in December 1979. It is a program to which the alliance remains committed.

In December 1979, the alliance agreed that while proceeding to deploy these systems we would also seek to negotiate with the Soviets with a view toward achieving a balance of these forces in Europe that would enhance the security of the West.

The President's proposal to eliminate this entire category of weapons we believed and continue to believe, would be the best possible outcome of these negotiations.

Having tabled the proposal to eliminate the entire category of weapons when the talks began on November 30, 1981, we waited for some considerable time before we received anything other than a negative response from the Soviets.

As you know, some months ago the new Soviet General Secretary, Mr. Andropov, publicly made what was widely described as a counterproposal according to which the Soviets would retain a SS–20 force even larger than the SS–20 force they had when the negotiations got underway on November 30, 1981.

The Andropov proposal was hardly what we would call a constructive step forward, but the arithmetic of that proposal was not immediately self-evident. As a result, it was described in a number of places in terms that suggested that it did indeed constitute a step forward.

Regarding the arithmetic, I think it is important that the record show how the Soviets have contrived the position that, as I say, would

actually leave them with more weapons than they had when the talks got underway.

They have proposed that they would retain in Europe—by which they mean west of 80° east and a dividing line that the Soviets have selected roughly paralleling the eastern slope of the Ural Mountains—162 launchers for SS–20's.

East of 80° east they would retain another significant number of launchers, but they have not specified exactly what that number would be. They have indicated that among the weapons that are presently west of 80° in excess of the number 162, they would dismantle a few dozen and the remainder would be moved east of 80°.

They presently have about a hundred SS–20's east of 80°. We don't know how many more they propose to move eastward under their proposal.

Even if they didn't move any eastward, even if they dismantled all the SS–20 launchers presently deployed in Europe, they would still be left with something on the order of 270 SS–20's, compared with the 250 they had on the day the negotiations began.

It is an indication I believe of the effectiveness of Soviet propaganda and an unhappy commentary on the ineffectiveness of our own ability to clear the air that a proposal which would leave them even in a better position than when the talks began received the widespread favorable publicity that it did in fact receive in Europe.

On recent days there has been a great deal of speculation about an interim proposal from the United States. Let me say that while sight of this was lost in the conduct of the negotiations following the President's speech in October 1981, in which he announced the proposal to eliminate the entire category of weapons, he said at the time, and has repeated on a number of occasions since, that that proposal is not a take-it-or-leave-it proposition, that we will respond seriously to any serious Soviet proposal, but that we have yet to see a serious Soviet proposal. I don't believe and I would doubt that this committee would believe that the Andropov proposal constitutes a serious proposal.

In the past we have made a mistake in arms negotiations in offering the Soviets successively more generous proposals without intervening counterproposals from their side.

I very much hope and believe that this administration will not repeat that mistake. We continue to hope that the Soviets will make a counterproposal that moves in the direction that we all desire, which is total elimination of these systems. And we would be quite happy to respond to such a proposal from the Soviet Union.

I couldn't help noting in the earlier testimony this morning, Senator Warner, a question predicated on the assumption that our allies have been asking us to make new proposals before the current round of Geneva negotiations terminates on the 29th of this month.

I am unaware that any such proposal has been made by our European allies. They have said, in some cases publicly, that we ought to be examining interim solutions, as indeed we are quite happy to do.

To my knowledge, no one has suggested that we should in a hasty and therefore potentially shortsighted way rush a new proposal to the negotiating table between now and the end of the month when the talks recess.

We are looking for solutions for interim proposals that would strengthen the position of the West and lead to the outcome we all

prefer, which is a settlement and negotiated agreement that improves the military situation. Too often in the past we have settled on an agreement for its own sake. We intend firmly to resist the pressures to do that.

NUCLEAR FREEZE

Finally, I would like to say a little bit about the nuclear freeze, not only because the issue will be before the House this week, possibly tomorrow, but because in all of the discussions of the freeze insufficient attention has been paid to two things.

One is the history of the growth of nuclear forces over the last decade or so—it has been a very uneven history—and the implications of that.

And second, the technical impact of the freeze on the strategic nuclear forces of the United States and Soviet Union.

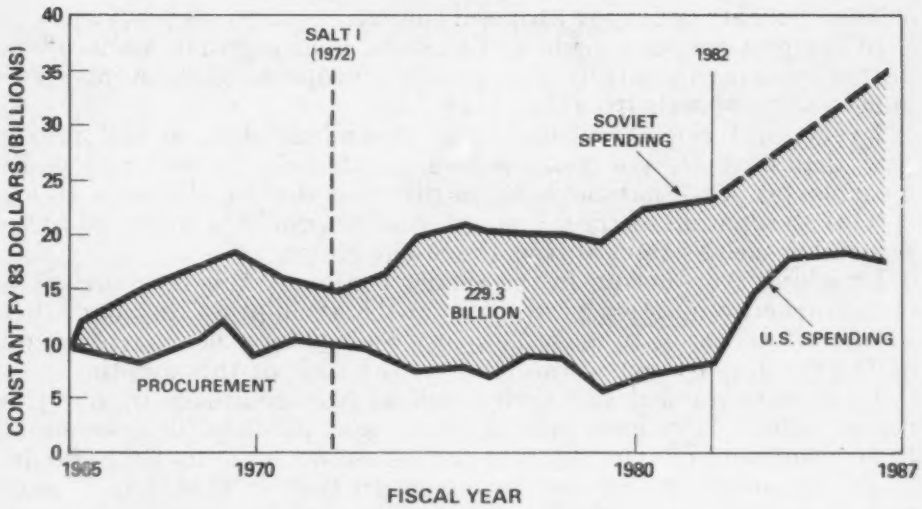
The impact is far from equal, indeed far from similar. Yet because the freeze contains the words that it shall be mutual, there is a tendency for people to believe it would have the same effect on the forces of both sides. That simply is not the case.

So, I would like to share with you some information that we have developed which is presently in a series of charts. I will run through them very quickly.

Just to make it clear that the balance we now see is the product of differental levels of investment in recent years, this first chart shows the United States and Soviet spending on the acquisition of strategic forces in the period 1965 projected forward to 1987.

U.S. AND SOVIET SPENDING ON ACQUISITION OF STRATEGIC FORCES

(1965 - 1987)



FROM THE SIGNING OF SALT I IN 1972 THROUGH 1982, THE TOTAL DIFFERENCE IN SPENDING ON ACQUISITION OF STRATEGIC FORCES IS APPROXIMATELY 140 BILLION

SOVIET SPENDING ESTIMATED IN EQUIVALENT DOLLARS

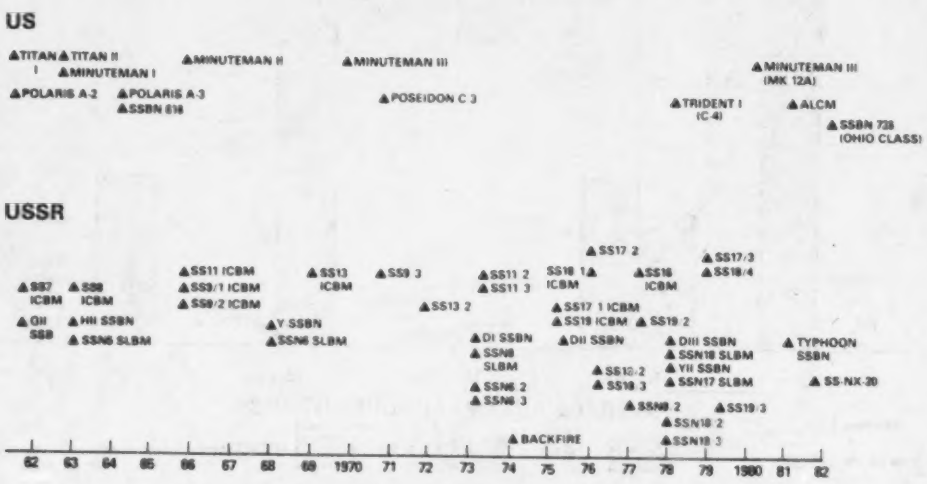
The gap in strategic spending has been substantial in favor of the Soviet Union. We have drawn a vertical dotted line at 1972.

Senator WARNER. Could that be pointed out?

Mr. PERLE. 1972 was, of course, the year in which we reached the first arms control agreement with the Soviet Union. As you can see, the gap widened following those agreements. It did not, as many hoped, narrow.

The next chart portrays what is often referred to as the arms race. Each of the triangular shaped symbols reflects the introduction of a new strategic weapon system by the United States, in the case of the blue triangles at the top of the chart; the Soviet Union in the case of the red triangles at the bottom of the chart.

THE STRATEGIC NUCLEAR ARMS "RACE"



INTRODUCTION OF SELECTED SYSTEMS BY YEAR

The Soviets have introduced 42 nuclear strategic systems in the period covered by that chart, 20 years. We have during the same time introduced 13. That is what is referred to as the arms race.

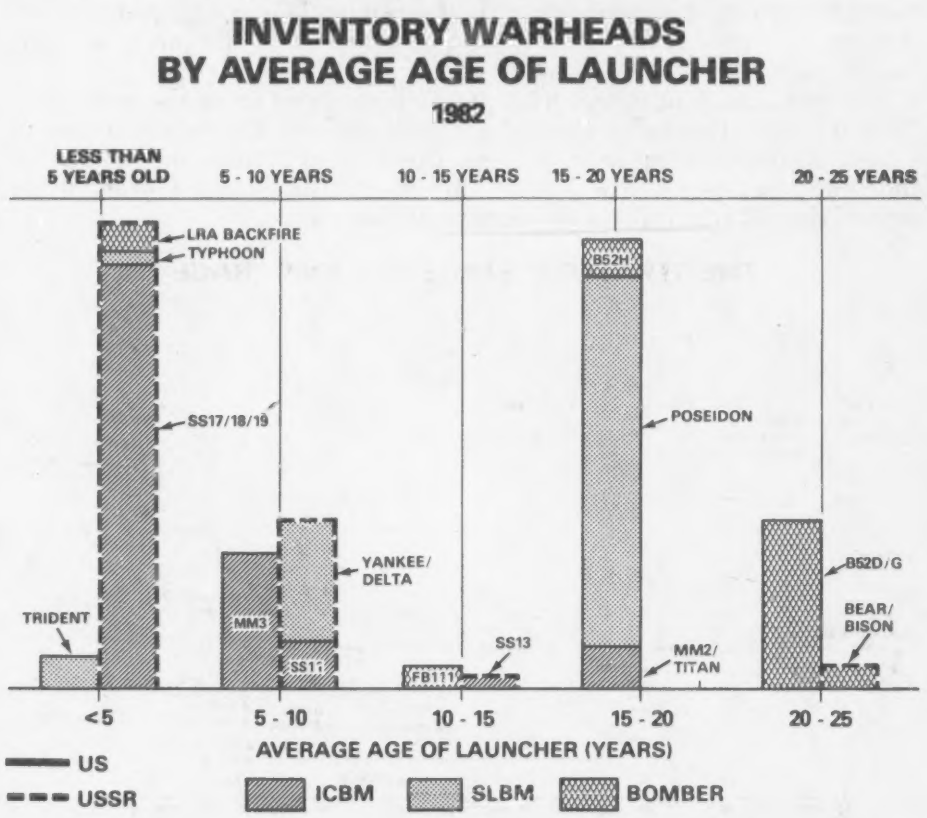
I would call attention to the dividing line of 1972. You will see that there are a very large number of triangles to the right of that dividing line, the introduction of new Soviet systems following the SALT agreement exceeded anything prior to the SALT I agreement.

You will also see we have introduced very little since that time. In fact, of the four systems that are shown since 1972, one of them, the Trident, so far has only one boat operational. The ALCM's are just entering the inventory now. So, this arms race has been a very uneven race.

Now I would like to get to the specifics of the freeze and what the freeze would mean.

This chart simply shows the relative antiquity of the United States and Soviet strategic forces. In the absence of the modernization program that the administration has recomended or something very much

like it, we have, Mr. Chairman, a strategic force that is on its way to the Smithsonian Institution while the Soviets have a strategic force that is for the most part of very recent manufacture.



This chart illustrates that rather well. If you look at the left-hand side of the chart, that first tall red column and the much shorter blue column next to it represents the weapons in the strategic inventory that are 5 years old or less.

As you will see, the Soviet SS–17, SS–18, and SS–19 missiles, the Typhoon submarine and the Backfire are all 5 years old or less. There are important elements of the Soviets' strategic force, as you know.

The only thing we are able to put in this category of 5 years old or less is the Trident submarine and that little blue box represents one boat.

Moving over to the category of weapons that are between 5 and 10 years old, you find the Minuteman III on the U.S. side and the SS–11 ICBM's on the Yankee and Delta class submarines on the Soviet side.

So, in the 5 years to 10 years category you see a lot of red, but not very much blue. There is blue on the chart that occurs on the right-hand side when you talk about categories of weapons that are 15 to 25 years old.

As you can see, most of our submarine force, the Poseidon, the Minuteman II's, and the Titans and the B–52H's, are in the 15- to 20-

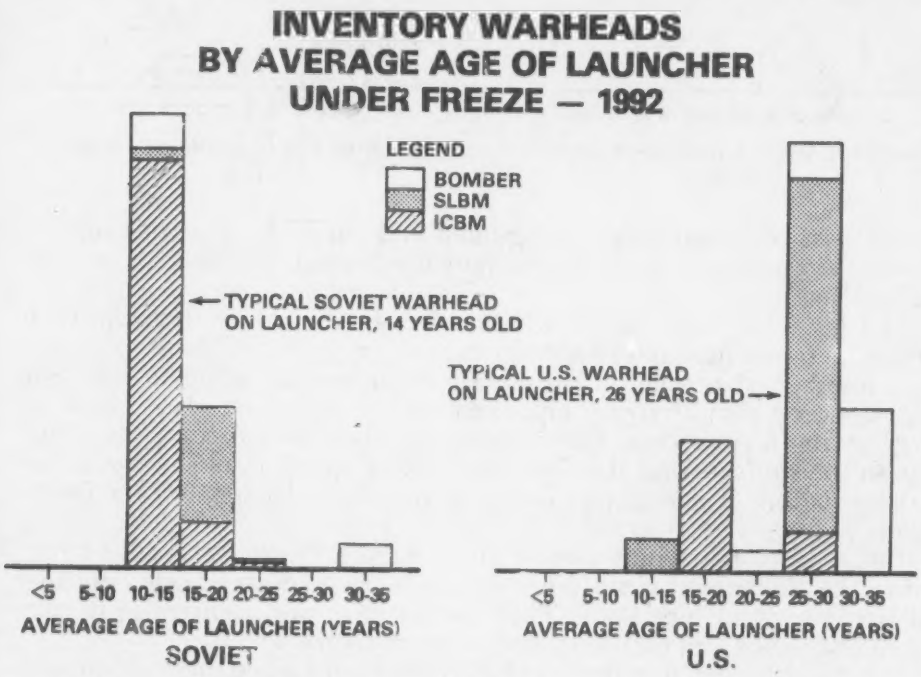
year old category, and our most modern B–52, the B–52H, was built 20 years ago.

The remainder of our strategic bombing force, the B–52D's and B–52G's are in the 20- to 25-year old category. The only thing that the Soviets have in that category of old age is Bears and Bisons.

What does this mean? It means simply that under the circumstances of the freeze even if it were mutual, even if it were verifiable and even if it could be implemented at once, immediately, today, we would face a situation in which our aging strategic force would become progressively less operable.

It would slide into obsolescence and the point would be reached when we would no longer have a strategic defense while the Soviets with their relatively modern forces would gain week by week, month by month, year by year increasing strategic superiority.

The next chart illustrates what the inventory would look like under the circumstances of the freeze. We have taken the year 1992.

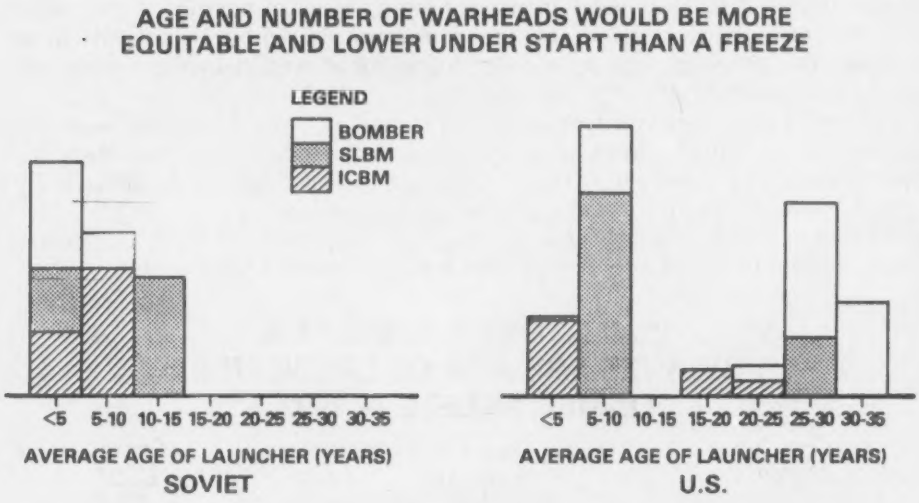


As you can see, and I won't belabor the point, virtually everything in the Soviet inventory, everything that matters, would be in the 5- to 10-year old category whereas virtually everything that matters on our side would be in the 20- to 25-year-old category, or beyond what we anticipated would be the operational life of our systems.

What that chart illustrates is that under the circumstances of the freeze, by 1992 the typical Soviet warhead would be on a launcher 14 years old, well within the operational life.

A typical warhead would be on an American launcher 26 years old, which is really beyond a safe and effective operational life. In short, in 1992 under a freeze, we would no longer have a strategic capability. It seems to us this is the principal reason why the freeze, with all

INVENTORY WARHEADS
BY AVERAGE AGE OF LAUNCHER
UNDER START — 1992



of the best of intentions, is misguided and would have a consequence precisely opposite to what its proponents hope it would achieve, that is, stabilization.

The issue has arisen as to whether we should reduce first and then freeze or freeze first and then reduce.

A number of people, in the House in particular, cling to the view that first we should freeze and then we can set about the process of negotiating a reduction. They argue, and this has a certain plausibility on the surface, that it is like an elevator which is ascending, it has to stop before it can descend and therefore we should have a freeze first.

But as that chart indicates, if there were a freeze, we would never move the Soviets off that freeze into reduction because they would be in the best of all positions. They would have no incentive to depart from the terms and circumstances of that freeze.

On the contrary, day by day the freeze would serve them better and better and therefore it is obvious that if we freeze first, we will never get reductions because reductions would not be in the Soviet interest.

Senator WARNER. On that point, as you well know, Senator Jackson and I have clearly stated our position on it, but I must say the record should contain the response of the freeze proponents and that is let us give it a try for 1 year or 2 years.

After that if the Soviets fail to live up to the obligations under the freeze proposal, then we can go back to the Reagan modernization proposal.

Mr. PERLE. I think they would be quite content to live up to the obligations. The obligations would entail the retention by the Soviet Union of the force that is already a formidable force and in relation to ours would become more formidable with the passage of time.

I would expect them to abide strictly by the terms of the freeze if one were agreed to.

Senator WARNER. And just wait for antiquity to take its toll?

Mr. PERLE. Sure. They would be in the position of the errant relative waiting for the rich uncle to pass away.

Senator JACKSON. What would be the impact of an immediate freeze now on the negotiations that Mr. Nitze has undertaken for the theater forces?

Mr. PERLE. With respect to the theater forces, there is no discernible difference between the freeze proposal and the Soviet position. Therefore, I would think Ambassador Nitze would have two choices. He could either pack up and come home or he could sign the Soviet proposal.

As a matter of fact, the freeze is slightly worse than the Soviet proposal since the Soviets have proposed to reduce by a few dozen the number of SS–20 launchers. The freeze would permit them to keep all those launchers and would leave us zero.

Senator JACKSON. There is absolutely no incentive for the Soviets to negotiate with us on a reduction in the SS–20's because we don't have anything——

Mr. PERLE. No incentive at all.

Senator JACKSON [continuing]. That is deployed, capable of countering the Soviets.

Am I not correct in understanding that despite all of the propaganda and the exhaustive news coverage of the issue, that all of the defense ministers of the NATO countries have opposed the freeze?

I have seen something on that, but what is the fact?

Mr. PERLE. On every occasion in which the defense foreign ministers have addressed the issue of freezing the NATO deployment to zero while the Soviets retained their forces, they have opposed it.

Recently the Greek Government abstained from making any statement on these issues. But with that one exception every one of the NATO governments is opposed.

Senator JACKSON. The French have been particularly outspoken.

Mr. PERLE. The French have been particularly outspoken. In fact, Senator Jackson, I have a chart that I want to show you that deals with the SS–20 deployment that was provided to us by a French official.

Dr. WAGNER. Before you go to the SS–20 I would like to point out that the age disparity for the theater nuclear weapons would be even worse under a freeze condition than what is shown here for strategic weapons.

Senator WARNER. Senator Jackson has very wisely brought up the NATO point.

Would you go so far as to say if we were to adopt in both Houses of Congress some type of freeze proposal of the nature of the one now pending before the House that this would be indeed the first step toward unraveling of the NATO alliance?

Mr. PERLE. I think it would have catastrophic consequences. It would require us to depart from an agreed alliance-wide understanding that we would proceed with the deployment of these modernized systems.

So, it would put the President in the position of having to choose between ignoring the views of the alliance or repudiating an agreement reached after considerable consultation in December 1979 which we reaffirmed on every occasion since.

It would be terribly damaging to the NATO alliance.

Senator JACKSON. Really it exposes NATO to a most dangerous situation in which we could agree to a freeze with the adversary having the local theater nuclear forces capable for reaching, in ballistic missile terms, the land of all the NATO countries and, of course, beyond that if they so chose. This would leave the NATO countries with nothing on which to bargain.

Mr. PERLE. Exactly. We have a chart that shows the range of the SS-20's.

"BUILD DOWN" APPROACH

Senator WARNER Before we go to that, I wonder if you could also address a resolution that was introduced by Mr. Nunn and Mr. Cohen calling for a "build down" type of approach to this situation. What are your views on that?

Mr PERLE. It has some features that are entirely consistent with our own view, in particular the stress that it lays on modernization. As we indicated, without modernization our strategic deterrence and our theater forces will decline to a point where we will no longer——

Senator WARNER. I am sorry, we have had a slight commotion up here. Would you go back on that?

Mr. PERLE The resolution lays great stress on the importance of modernizing our forces. We share that view entirely. In the absence of modernization—a freeze being an extreme form of nonmodernization——our strategic and theater forces will become progressively less able to provide for our security

We think modernization is very important. The "build down" proposal also lays emphasis on reductions and the President has proposed significant reductions in both the INF negotiations and START negotiations.

From a technical point of view it requires two weapons to be retired for every new one that is produced. Given the massive modernization requirement we have and the relatively modern Soviet forces, it would mean an increasing gap in the comparative effectiveness of the two forces. But those technical impacts I think are in principle distinguishable from the general thrust of that legislation.

Senator WARNER. But there needs to be in your judgment some corrective features to the resolution as it has now been presented?

Mr. PERLE. Yes; if we had to implement it literally, it would cause some serious programatic difficulties.

Senator WARNER. As I understand it, it would place us in a position of dangerous inferiority in about 4 or 5 years time?

Mr. PERLE. It would create real problems as we were forced to link our forces in relation to the Soviet forces simply in order to carry out necessary modernization. But we would be quite receptive to changes in that proposal that would avoid that difficulty

I might mention in passing there was a piece in the New York Times on the op ed page that has a striking statement. It says:

If the resolution—

Referring to the resolution now in the House calling for a freeze—

Were adopted even by both Houses of Congress, there would still be no chance that the Reagan administration would accept the present unbalanced proposals put forward by the Soviet Union. Moscow surely knows this.

The irony of that statement is that the Soviets have indeed put forward precisely the proposition that is contained in the freeze resolution. The Soviets have proposed a freeze and they have proposed a freeze precisely because it produces the sort of result that we were showing a moment ago.

Senator WARNER. That freeze embraces the Soviets' position?

Mr. PERLE. It is quite similar to the Soviet position in both INF and START.

FRENCH AND BRITISH CAPABILITIES

Senator JACKSON. What is the administration's response to the Soviet contention that of course the French had a capability of hitting the Soviet Union as well as the British with their sea-launched ballistic missiles?

Mr. PERLE. The French, Senator Jackson, have only 18 land-based missiles. The British have none. With the exception of 18 French missiles, the whole of the British and French force consists of submarine-launched ballistic missiles which the British and French regard as strategic forces to be used in the last resort, the last resort being to respond to a Soviet attack on the cities of Britain and France. None of these systems are under the control of the United States.

They therefore don't figure, in our judgment, in any intelligible way in the balance in the theater. Moreover, we are bound by the December 1979 decision and by the normal propriety of relations among allies not to bargain away forces that are not our own, not to agree on limitations on forces that are under the sovereign control of the countries. We have pledged not to do so.

Finally, alongside the 25,000 or so nuclear weapons that the Soviets possess, 162 British and French weapons are hardly a significant factor in the balance. We believe, and I believe there is substantial evidence to bear this out, that the Soviet focus on the 162 British and French forces is intended both to stalemate the negotiations, because they know we will not accept counting those, and to divide the United States from its allies.

It is not a serious factor in the military equation. It may give the British and French—they surely believe it does—some ability to deter that final attack on their territory. It does not figure in the theater balance.

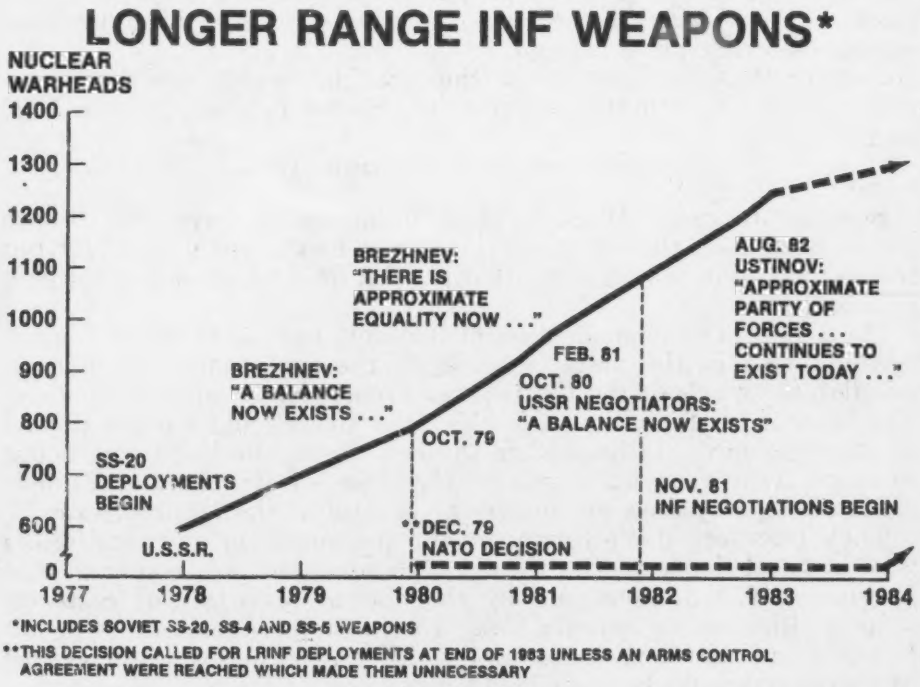
Senator JACKSON. How would you handle a Russian response to the effect that "We, the Russians, do not allow any proliferation within our alliance, that none of our allies in the Warsaw Pact have any nuclear devices, that we are the true antiproliferators"?

Mr. PERLE. I think if we had allies that stood in the same relationship to us as the Soviet allies stand with the Soviet Union, we would make sure they didn't have any, too.

Senator JACKSON. In other words, you think the Russians might not be sure which way they would march in the event of attack?

Mr. PERLE. They have observed that a weapon that is pointing west at one moment can be pointed east the next. In fact, the Soviets have been massive proliferators over the last decade. They have simply kept the proliferating weapons under their strict control.

I have one last chart which is particularly interesting. Indeed it is responsive, Senator Jackson, to the point about the British and French forces.



You are too far away to read the print, but let me tell you what this chart shows. Beginning in 1977 and running through to the present, indeed projecting a little bit forward, it shows the number of United States and Soviet intermediate-range missiles in Europe.

Of course, that number is zero on the U.S. side, although we are making preparations now for the deployment of those 572.

The red line shows the growth of Soviet SS–20's. At various points along that line we have noted significant dates. December 1977 is the first point. That is when the Soviet SS–20 deployment began. In October 1979 Mr. Brezhnev said a balance now exists.

You will see that was the point at which they had roughly 750 intermediate range nuclear missile warheads in October 1979; a year later, the Soviet negotiators said a balance now exists. By that time the number had risen to 950. It was still zero on our side.

By February 1981 the number had risen to just under 1,000. Mr. Brezhnev said there is an approximate equality now. Most recently in August 1982 Defense Minister Ustinov referred to the approximate parity of forces which continue to exist today.

In other words, at every point along that steeply sloping curve, each point reflecting more weapons on the Soviet side, the Soviets have repeated the statement that a balance exists.

Either a balance existed in October 1979 and therefore no longer exists today or it didn't exist in October 1979, but you can't have it both ways.

The fact is that the Soviets throw the term "balance" around for their own convenience. There is not a balance now, there was not a balance in October 1979. There will not be a balance until we proceed with deployment on our side.

I might say that even if we were to carry out the full anticipated program of 572 launchers, we would still be well below the levels the Soviets have already attained, so under no circumstances will a numerical balance be achieved, although we believe that it is critical that we end the situation in which there is a monopoly of these forces on the Soviet side.

That, Mr. Chairman, concludes my opening remarks.

Senator WARNER. Had you finished with the SS–20 chart? We interrupted you at the time that was put up.

Mr. PERLE. Yes.

Senator WARNER. Would you like to put it up one more time and stress that point?

TARGET COVERAGE OF SOVIET SS-20 AND NATO PERSHING II AND GROUND-LAUNCHED CRUISE MISSILES (GLCM)

TABLE BELOW SHOWS SOVIET SS-20 DEPLOYMENTS

	END YEAR	1977	1978	1979	1980	1981	MARCH 1982	MARCH 1983
SOVIET	MISSILES	10	70	140	200	270	300	351
	WARHEADS	30	210	420	600	810	900	1053
NATO	MISSILES/ WARHEADS	0	0	0	0	0	0	0

Mr. PERLE. This relates back to the question of coverage the Soviets can achieve with SS–20's. The red ring indicates the area that can be targeted by the SS–20's. Shown in black, and I am sorry to say more difficult to see, is the area that can be covered by Pershing II and ground-launched cruise missiles.

You will note the Pershing II falls far short of Moscow and the ground-launched missiles cover only a small fraction of Soviet territory.

The notion which I have heard expressed that the Soviets are justified in having a particular concern with respect to the Pershing II because it has a flight time of 5 minutes, which happens, by the way,

to be wrong, it is something on the order of 2½ times that, and because of the short flight time, it could destroy the Soviet command and control apparatus, is simply wrong.

Much of the Soviet command and control apparatus is well beyond the reach of the Pershing II missile. In any event, we only propose to deploy 108. There is no target in the Soviet Union of which I am aware that could be effectively attacked by 108 Pershing II missiles that could not be as equally effectively attacked by some other set of weapons.

So the Pershing II has no unique military capability that would give rise to the Soviet claim that it would fundamentally alter the theater balance.

One unique characteristic is that it is deployed under the NATO plan in the Federal Republic of Germany. I believe it has been the Soviet purpose in these negotiations from the very beginning to attempt to pry Germany loose from the Western alliance and to attempt to exploit the indications of a growing neutralist sentiment that they thought they detected in the last several years in the Federal Republic, although I would hope after the election results that returned the Kohl Government to power they would need to assess whether there is a rift in the Federal Republic.

Senator WARNER. Secretary Wagner, why don't you provide us with some comment.

STATEMENT OF HON. RICHARD L. WAGNER, ASSISTANT TO THE SECRETARY OF DEFENSE (ATOMIC ENERGY)

Dr. WAGNER. I have no prepared comment, Mr. Chairman.

Senator WARNER. Do any of the service representatives care to make opening comments before we proceed to some questions?

If you would like to give a short overview of the programs, it would be helpful.

STATEMENT OF BRIG. GEN. GERALD G. WATSON, U.S. ARMY, DIRECTOR, NUCLEAR AND CHEMICAL DIRECTORATE

General WATSON. Thank you, Mr. Chairman.

I would like to briefly give you an overview of the Army's program and as you know, this basically deals with the shorter range systems.

SHORT-RANGE SYSTEMS

If we were to take those comments and those charts that Mr. Perle showed, it would very definitely parallel the situation we see in short-range systems with respect to the aging force and the programed antiquity that we are going to incur if the modernization program that we have set forth does not continue.

In looking at the short-range systems, it is very apparent that those systems deter the Soviet conventional forces at the divisional and second echelon level. Without those short-range systems, our ability to deter the Soviet Union I think is in jeopardy or certainly at high risk, sir.

If you look at the proliferation that has occurred in the Soviet conventional systems with their rather substantial increase in the number of tanks, their 64 percent increase in artillery, 51 percent increase in armored personnel carriers and mechanized systems, it also becomes very apparent that the Soviets are aware of their vulnerability to short-range systems.

It is this vulnerability that they are trying to overcome by hardening their force and by making them more mobile and thus able to deploy them to their breakthrough attacks from a much greater distance.

So, from where we stand in the Army system we very much believe that the short-range theater systems serve as a very significant deterrent to the Soviet use of their rather massive conventional forces.

U.S. SYSTEMS OUTDATED

The second point that I would make is one that has already been made and that is our systems are getting very old. They are approaching the end of their shelf life and thus are not as effective as we need.

The third point that I would make with regard to the short-range systems is that we see a rather large proliferation on the part of the Soviets in the development of their short-range systems. Within the last 10 or 12 years we have seen them deploy several new nuclear capable cannons. They are replacing their Frogs and Scuds with second and even third generation missile systems that can deliver warheads to ranges significantly greater than our own.

The proliferation that we see within those short-range systems in the Soviet Union are sufficient to cause us great concern and thus it is necessary that we continue to modernize in order to gain any deterrent leverage against those kinds of systems.

I would also point out two programs that are now in very serious trouble and we need support.

PERSHING PROGRAM

We need to continue with the Pershing program. We have had significant successes in the last four launches and we believe it is now time to go ahead and make those resources available so that that program can continue.

The second is the 155 nuclear round, the W82. Last year we were unsuccessful within the Department of Energy in being able to facilitize that system sufficiently so that we could continue into production. That 155 nuclear system is very critical to our ability to deter. Two-thirds of our certified systems are in the 155mm caliber. Therefore, we present to the Soviets a rather difficult task in trying to target all the systems and thus our ability to survive is greatly enhanced if we have the 155 system in our inventory. The result is that the 155 system is perceived by our adversaries as being a very significant deterrent to their ability to succeed.

That concludes my remarks, sir.

Senator WARNER. Admiral Holland?

STATEMENT OF REAR ADM. W. J. HOLLAND, JR., U.S. NAVY, DIRECTOR, STRATEGIC AND THEATER NUCLEAR WARFARE DIVISION, OFFICE OF THE CHIEF OF NAVAL OPERATIONS

Admiral HOLLAND. The Navy program consists basically of four elements, Mr. Chairman.

SURVIVABILITY

We will be stressing survivability and improving our capability to operate in the nuclear environment: Most of that work involves testing to determine what we really have to do and then develop the improvements that we must make to our ships and aircraft.

We need to modernize our ASW and AAW weapons. The weapons we presently have are older and less effective against modernized Soviet threats.

CRUISE MISSILE STRIKE FORCES AT SEA

We will within the next 2 years, put the cruise missile strike forces at sea. This proliferation of survivable fire power will cause significant problems for Soviet planners and should enhance raising the nuclear threshold.

Finally, the Navy has a good deal of work to do this year and next in the training and tactical awareness required to operate the ships and weapon systems that we are developing in the nuclear environment.

Senator WARNER. Admiral, will you defer for a moment? Senator Jackson has to depart and wants me to ask two questions of Mr. Perle while he is here.

ZABLOCKI FREEZE RESOLUTION

Secretary Perle, press accounts have described the Zablocki freeze resolution, as approved by the Foreign Affairs Committee, as differing from the original freeze resolution in the House, one example being the resolution calls for a negotiated freeze and would therefore permit some modernization of certain systems to go forward.

Would you describe the basic differences between the present Zablocki resolution and the original freeze resolution in the House and whether or not the present one in any way marks a step toward being more acceptable?

Mr. PERLE. It certainly is not more acceptable. It is confusing in a number of respects. I don't have the language in front of me, but it would require the administration to do things that are in contradiction with one another. I don't know what it means to say that we should have a negotiated freeze.

Does that mean that the freeze should be only a partial freeze and not a total freeze?

In other words, it is impossible to tell from looking at that resolution what it is that will be frozen unless everything is frozen and I believe the only way one can read the language as recommended is requiring indeed that we go to the Soviets and propose a total freeze.

I was up before the House Foreign Affairs Committee. Congressman Markey, the author of the original freeze on the House side, said that the freeze would not preclude the deployment of Trident submarines.

As I read the language, and I asked him where in the language he could find reference to the permissibility of Trident submarines, it became clear there is no such language. Congressman Markey was interpreting language that was saying something quite other than that.

I don't see any way we can read that resolution as requiring other than a total freeze. If it means something other than that, it should be amended on the floor to make sure what it does precisely mean.

Senator WARNER. The New York Times remarked that such a negotiated freeze would not preclude some new weapon deployment on either side so long as overall freeze limits are observed.

Mr. PERLE. If they mean quantitative, but not qualitative freeze, then they ought to say so.

I would urge my colleagues in the administration to take a long, hard look at whether we cannot find a way to live with the concept of a quantitative freeze. It is entirely possible that we could, but we can't live with a qualitative freeze that halts all our modernization program.

That I believe is the effect of the Zablocki resolution. I must say it is an extraordinary situation where you have a resolution that is described as meaning different things by even its own sponsor.

I would strongly urge the House to amend the Zablocki freeze resolution so that it applies only to the number of weapons and not the modernization within those numbers. As I say, then we would certainly take a fresh look at it.

Senator WARNER. Wouldn't your first recommendation be not to adopt the resolution as opposed to amending it?

Mr. PERLE. I would think it better to reject the resolution, not least of all, Mr. Chairman, because we presently have on the table in Geneva a proposal that we should have thought would meet with wide approval in the country, and in the Congress; and to put the President in a position of coming under an injunction by the Congress to propose something to the Soviet different from what he has in fact proposed and closer to the Soviet position than what he in fact is proposing can have only one effect and that is to undermine the President's ability to negotiate.

I believe this action is almost unprecedented. If I may say so, to propose a resolution that would have the effect of undermining the President's negotiators in Geneva when in the case of START we have only had two rounds of those negotiations, without giving the administration a decent chance to try to produce an agreement that would involve significant reductions, is I believe without precedent.

Senator WARNER. In the history of this country and our negotiations.

Mr. PERLE. I can't think of another occasion in which the Congress asked the President to accept a position closer to the position of our adversary and do so after a few months of negotiation.

Senator JACKSON. Isn't the real problem here, of course, that it does substantially impair the negotiating process?

The resolution as a matter of law does not have any impact. It is merely an expression of intent, but to our adversaries at the conference table it gives them an enormous edge because there is no way in which we can have that degree of credibility which will result in an agreement that protects our vital national security interests.

It is a direct interference with the ability of the President, I should say an American President, to carry out his constitutional responsibilities.

It adds confusion. No one really knows what is meant by it. I have talked with a number of these people and I have pointed out what it does to our allies. "Well, we don't mean that."

All you can look at is the resolution itself and the idea of stopping the arms race as they put it and the idea of saying, "Isn't enough enough?" has a lot of appeal.

The real tragedy of it is that I think the overwhelming majority of people in this country want to do something and see something accomplished in the way of arms reduction.

The real question is how do you get the process going? How do you provide the incentive to get the other side to join?

A number of us who have been concerned about it, most of them are dead now, I regret, joined over 30 years ago to eliminate by resolution all nuclear weapons. The late Brian McMahon and I introduced that in 1951 and again in 1953 after I watched the hydrogen device go off at Eniwetok.

Anyone who has watched it and been there close up knows the perils that are involved. But the interesting thing is that the Soviets turn all those things down and clearly the challenge that we face is how do you provide the incentive, Mr. Chairman, and the encouragement on the other side to get this reduction process going so that one day you will be able to eliminate at least in the Soviet Union and on the American side these enormous weapons of destruction.

Senator WARNER. While Senator Jackson is here, Senator Jackson and I introduced a resolution in the Senate during this debate last year and at the present time we are looking at the option of introducing a revised resolution here in the next few days. We hope to give our President the necessary degree of flexibility that we spoke of this morning, and we hope to prevent the commencement of the unraveling of the NATO alliance that you warned us about should this thing be adopted in the conference.

As soon as we have completed it, we will very much want to have your views.

Mr. PERLE. We appreciate your efforts to find a statement that expresses the broad public concern which we feel is entirely justified, but does so in a responsible manner that will not undermine the efforts of this or any other administration to try to achieve the reductions to which Senator Jackson referred.

I would hope that no President would ever be put in a situation where, while he is in the midst of negotiations, the Congress passes a resolution that calls on him to abandon a negotiating position and accept one which comes much closer to that of the adversary, or as I said earlier, with respect to the intermediate range nuclear forces a position

identical with the position of the adversary except it may be slightly worse.

Senator WARNER. General, would you like to present the Department of the Air Force program?

STATEMENT OF BRIG. GEN. J. T. CALLAGHAN, U.S. AIR FORCE, DEPUTY DIRECTOR, REGIONAL PLANS AND POLICY, DCS/PLANS AND OPERATIONS

General CALLAGHAN. Thank you, Mr. Chairman.

My remarks this morning will be brief in view of what has been said previously.

Based on the NATO decision to modernize intermediate-range nuclear forces, the Air Force is modernizing principally in two areas.

First of all, with regard to our manned aircraft, about 60 percent of our aircraft in Europe are dual-capable; that is to say, they are capable of both conventional and nuclear missions. With the introduction of the F–16, this force continues to be modernized.

Second, and perhaps of more interest to the committee this morning, the Air Force will begin deployment of ground-launched cruise missiles this year.

I would like to say, Mr. Chairman, that past committee support for Air Force intermediate-range nuclear forces is appreciated and continued support for these imoprtant programs in the future is essential.

Thank you, sir.

Senator WARNER. In order to expedite this hearing, I am going to ask one question in the open and defer to any of my colleagues who might wish to ask questions and then we will go into closed session.

WEAKNESS OF U.S. FORCES VERSUS SOVIET UNION

Throughout these debates on the freeze the question is often asked—in an attempt to refute the contention of the weaknesses of the United States forces versus the Soviet Union—whether or not those in senior positions, uniformed and civilian, would be willing to trade our military and strategic capabilities for the corresponding Soviet military capabilities.

Mr. PERLE. I would, Mr. Chairman, in a flash, if what I desired to achieve was a strategic force optimized for the purpose of coercion and intimidation.

There is no question that the Soviet ability to carry out an intimidating first strike vastly exceeds that of the United States and has done so for some years now.

So, I would not hesitate in exchanging forces with them. The previous Chairman of the Joint Chiefs of Staff used to answer this question in the negative. He can speak for himself as to why he came to that conclusion.

I think this is the sort of question that puts any commander-in-chief or service commander in an awkward position because he not only is an analyst of strategic battles, but a leader of troops in the field, a commander of forces.

It is a very disagreeable acknowledgement to have to make. It has an impact on morale and therefore the tendency is to shy away from it.

I believe the current Chairman of the Joint Chiefs of Staff takes a view similar to my own.

Senator WARNER. Senator Jackson?

Senator JACKSON. No questions.

Senator WARNER. Senator Levin?

TRADING TRIAD FOR TRIAD

Senator LEVIN. Did I hear you say you would trade our triad for their triad?

Mr. PERLE. Senator Levin, what I said was that for the purposes of a strategic force with first strike capability and even greater first strike potential, a force aimed at coercion and intimidation, I would trade our strategic force for the Soviet strategic force.

Senator LEVIN. Is that the same thing as saying you would trade their triad for our triad?

I was trying to figure if I heard you right.

Mr. PERLE. You heard me right. If the question is do I think that our submarine-launched forces are superior to their submarine-launched forces——

Senator LEVIN. The question is would you trade our triad for their triad. That is my question.

Mr. PERLE. I think I will have to answer that the third time the way I answered the previous two times.

It would depend on the sort of force I wanted. For the purpose of a coercive and intimidating force, I would rather have theirs. That is not our philosophy or strategic doctrine.

Senator LEVIN. Forget the philosophy and strategic doctrine.

Would you trade our triad for their triad?

Mr. PERLE. No, I would not.

Senator WARNER. Would you trade parts of it?

Mr. PERLE. I would gladly trade parts of it.

Senator WARNER. Let us get this on the record.

Senator LEVIN. Presumably the Soviets would be happy to trade parts of it too.

Senator WARNER. This may be ridiculous to have this discussion. Nevertheless, it raises all of these things and I think it would be helpful if you put it on the record.

What parts would you trade?

Mr. PERLE. Clearly the Soviet ICBM forces are vastly superior to our own. The Minuteman and Titan, I would trade. The Soviet defense force adjuncts to the Triad, a very important part of it because it affects the capability of our triad, is vastly superior to our own. Ours is virtually non-existent.

Senator WARNER. How about the Soviet ABM system around Moscow compared to what we have?

Mr. PERLE. I would trade that. In quantitative terms the Soviets have an advantage in submarine-launched forces, but I believe on the whole our SLBM's are superior. However, under certain circumstances of the freeze I would sure try to get a trade in quickly because our SLBM

carriers are becoming inoperable due to old age and the Soviets' are not.

Senator WARNER. That is anticipated in the early 1990's for the American SLBM force?

Mr. PERLE. That is correct.

Finally, with respect to the bomber force, I think the Backfire is a new and modern weapon and its follow-on would compare very favorably with our existing B–52 force. That is especially true if we are not permitted to put air-launched cruise missiles on those B–52's which under the circumstances of the freeze we would not be permitted to do.

Finally, let me say that I think this question is an almost meaningless question. It doesn't advance our understanding of the problem in the least.

Senator WARNER. I think you would have to start from the approach that for forces that, as you have carefully said, were intended for the purpose of intimidation and coercion you would prefer theirs.

Would you surmise from the direction in which they are going with their modernization program that indeed their goal is coercion and intimidation?

Mr. PERLE. I know of no other way to interpret the emphasis they have placed on the forces they have chosen to acquire, particularly those forces they have chosen to acquire since we have begun living under an arms control regime—in the last 11 years.

Senator WARNER. If at any time they had a purely defensive strategic posture, looking at their current modernization program and the hardening that is progressing in a number of areas, it seems to me that a conclusive case can be made that this is the direction in which they are moving—toward an aggressive strategic posture.

Mr. PERLE. I agree with that. We have tried to put that proposition to the test by putting to them arms control proposals which would enable them to express their commitment to a less aggressive strategy. So far they have not.

Senator WARNER. We will go into executive session unless you have questions.

Senator LEVIN. I do have a few questions.

Senator WARNER. Please proceed.

Senator LEVIN. I started to ask about what you testified to and I am glad you clarified it, given our philosophy and doctrine, you would not swap the Triad.

I presume if you were a Soviet military leader or planner that you would be happy to swap some of theirs for ours in some areas?

Mr. PERLE. I think what the Soviets are doing, having acquired an overwhelming superiority in land bases, is proceeding to improve the capability of both their bomber force and submarine force.

Senator LEVIN. If you were a Soviet planner or chief of state would you swap parts of their forces for ours?

Mr. PERLE. I think I would rather have our submarine forces than theirs.

Senator LEVIN. Anything else? Bomber forces?

Mr. PERLE. The bomber forces are very much a question of where we are going with bombers. The Soviets have a new bomber under development.

Senator LEVIN. Cruise missile technology?

Mr. PERLE. They are very rapidly closing on us.

Senator LEVIN. Would you swap right now if you were a Soviet planner?

Mr. PERLE. I would not swap.

Senator LEVIN. If you were a Soviet leader, would you swap theirs for ours?

Mr. PERLE. Theirs is very similar to ours since they got it from us.

Senator LEVIN. So they are not ahead on nuclear cruise missile technology?

Mr. PERLE. I think for the purpose I can say in this open hearing they are rapidly approaching our technology because they got it from us.

Senator LEVIN. Ambassador Nitze and his counterpart in Geneva supposedly outlined an interim solution in the INF talks which had a number of features which have been described publicly. Reportedly the Pentagon played a role in having the United States reject that proposal. I am wondering whether or not that is true?

Mr. PERLE. I will be glad to make a general statement in this open session and a detailed statement if you would like in closed session.

The ideas that were discussed between Ambassador Nitze and Ambassador Kvitzinskiy were reviewed in Washington and I believe in Moscow as well. They were largely Ambassador Nitze's ideas. When Ambassador Nitze returned to Geneva it was with the authority to keep open the private channel in which those ideas had been discussed.

He was, upon arrival in Geneva, confronted by a Soviet denunciation of the ideas that had passed between them and by an impassioned Soviet attack on the United States position and I believe that began with Kvitzinskiy's arrival at the Geneva airport.

The answer is that the review that was conducted of those ideas resulted in Ambassador Nitze having the authority to continue to discuss it in that private channel and the Soviets flatly and coldly turned it down.

Senator LEVIN. In other words, the United States did not reject that proposal?

Mr. PERLE. That is correct.

Senator LEVIN. Nitze was not given any instruction not to accept or pursue that particular proposal?

Mr. PERLE. I would like to get into the details in closed session, but I will say he had all the authority he needed to respond to the Soviets had the Soviets been responsive to the ideas that had been discussed.

Senator LEVIN. Are you able to say in public whether or not he was directed not to pursue that particular proposal?

Mr. PERLE. I don't mean to be evasive——

Senator LEVIN. You are succeeding anyway.

Mr. PERLE. Not every detail in that proposal.

Senator LEVIN. I am talking about the proposal as a whole. Was he directed not to pursue that proposal as a whole?

Mr. PERLE. No——

Senator LEVIN. Were you involved——

Mr. PERLE. To the best of my knowledge, he was not.

Senator LEVIN. Were you involved in the discussions that were held relative to that proposal?

Mr. PERLE. I was.

NEUTRON WEAPONS IN EUROPE POSE POLITICAL PROBLEM

Senator LEVIN. Is it your understanding that the placement of neutron weapons in Europe would not be a political problem for some of our European allies?

Mr. PERLE. I should think in the main the deployment now of neutron weapons would be a political problem, but I haven't discussed this recently with the allies.

Senator LEVIN. It would be?

Mr. PERLE. It would be.

Senator LEVIN. Finally, on this question of this intermediate proposal which we hear our allies want us to offer by the 28th, you have indicated that you don't know of any allies who are pushing us to make such an offer by the 28th.

Do you agree, however, with the apparent alleged reported desire of many of our allies that the administration propose some sort of interim alternative to the zero option at some point?

Mr. PERLE. I think there is a desire among some of our allies for us to demonstrate that we are flexible in these negotiations.

Senator LEVIN. Are we going to at some point offer an interim proposal?

Senator WARNER. Isn't that the subject that we want to cover here in executive session?

Mr. PERLE. Certainly the details in closed session.

The question does give me an opportunity to say that it has been our position in the very beginning that we would be responsive to negotiate in good faith to any Soviet proposal. They have thus far not made a serious proposal that would justify our making response to them.

So, the door has been open from the first day of the negotiation to discuss alternatives to zero.

Senator LEVIN. I don't want to push you for any details except in an executive session.

Are you able to say publicly that based on what is on the table now from their side we are not prepared to offer an interim proposal?

Mr. PERLE. That would entail making two proposals in a row in the absence of a serious proposal from them.

Just as a matter of negotiating style, that has its problems.

Senator LEVIN. I don't understand your answer. Are you saying, and again I don't want to push you for any detail, can you say publicly, based on what therefore is on the table, we are not able to make a counteroffer without a new offer from them?

Mr. PERLE. We have made no decision to make a counteroffer.

Senator LEVIN. We have not decided whether or not to do that?

Mr. PERLE. That is right.

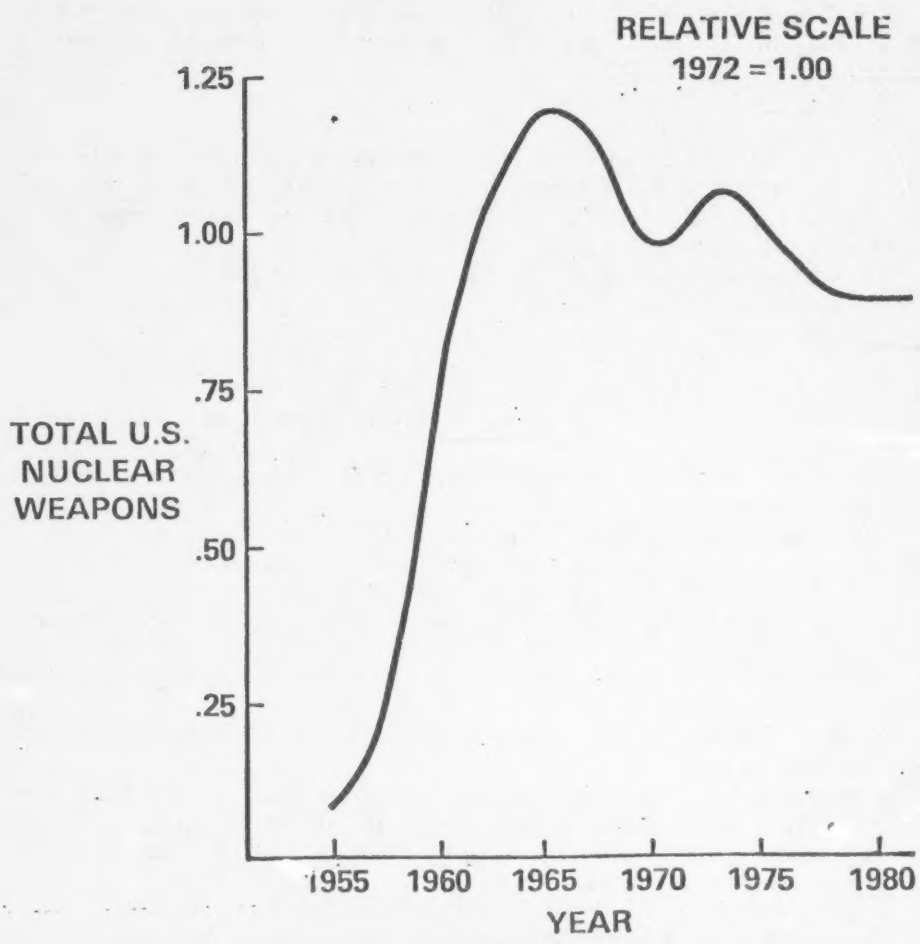
Senator LEVIN. Thank you.

Senator WARNER. Mr. Wagner, one chart put up in open session relates to documentary evidence that the United States has been engaged in unilateral "Build Down" of the nuclear weapon stockpile since 1960.

Do you have that chart with you?

Dr. WAGNER. I do not have that in chart form.

Senator WARNER. We just happened to have it in the back room. I keep it handy.

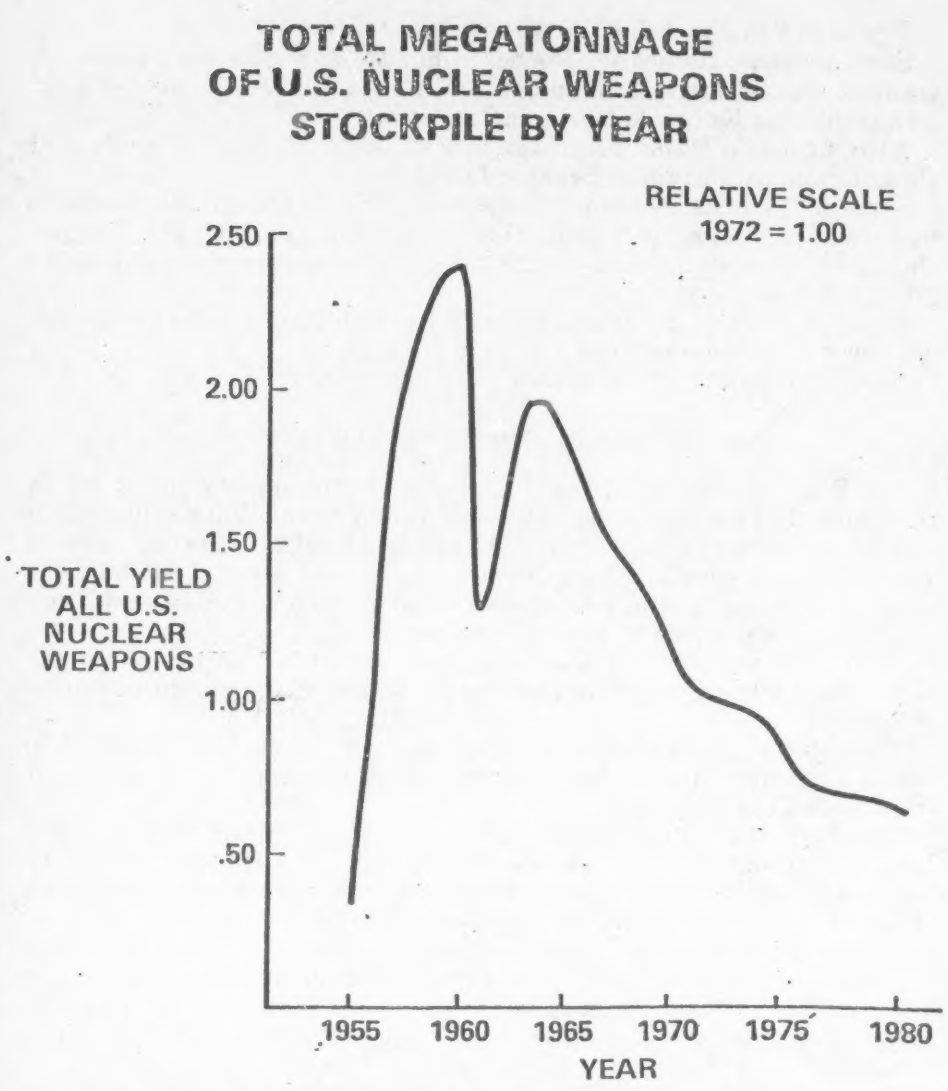


Dr. WAGNER. That is a chart produced by our office. That is exactly right. As you can see, it is without numbers on the left-hand side because those numbers are and should remain classified.

However, it does show the buildup during the fifties and early sixties and then the reduction in the numbers. The fact of the matter is that during the early sixties we had a large number of bomber-carried weapons and we modernized the forces in the late sixties and early seventies.

We reduced the bomber component and increased the missile component, the net effect being the reduction you see there.

Senator WARNER. There is a comparable yield chart here that I happen to have.



Dr. WAGNER. That reduction in numbers was accompanied also by an even more striking reduction in total yield in the weapon stockpile. Those kinds of reductions are true for the tactical weapons as well, the details change somewhat, but it is generally true for tactical weapons.

Senator WARNER. Gentleman, we will now go into executive session. Let us take a 3-minute break. I will ask the clerk to clear the room.

[Whereupon, at 11:35 a.m., the subcommittee proceeded in executive session.]

EXECUTIVE SESSION

The subcommittee proceeded in executive session at 12:10 p.m., in room SR-222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Present: Senator John W. Warner.

Staff present: James G. Roche, minority staff director; Frank J. Gaffney, Jr., Patrick L. Renehan and James C. Smith, professional staff members; Karen A. Love, staff assistant.

Also present: Hank Steenstra, assistant to Senator Quayle, and Peter Lennon, assistant to Senator Levin.

Senator WARNER. Secretary Perle, we would like to go into questions in executive session, but prior thereto I think you and Dr. Wagner should have an opportunity to make your own observations before we go on with the questions.

Mr. PERLE. Mr. Chairman, I really have nothing to add to the discussion we had this morning.

Senator WARNER. Dr. Wagner.

THEATER SYSTEMS AND CONVENTIONAL SYSTEMS

Dr. WAGNER. Mr. Chairman, I would like to amplify just a bit on the point that both Admiral Holland and General Watson made this morning which relates to a key characteristic of our theater systems which is their survivability. We know a fair amount about how the Soviets view the military relationship between their systems and conventional systems as well as our theater systems.

That view is that their No. 1 doctrinal intent is that they must destroy our nuclear systems before our nuclear systems can hurt them in return.

They devote a great deal of effort to that—both conventionally in terms of agents, special force units, and conventional deep maneuver units, as well as nuclear.

I suspect that they would prefer not to use the nuclear systems because I think the battlefield would freeze in effect if nuclear weapons were used, so they would prefer to destroy our systems conventionally if possible and they would devote resources to do that.

On the nuclear side of the survivability question I should say there is a class of systems that is not much talked about in the discussions that we hear, which the Soviets have a major advantage in, and that is mid-range missiles, missiles with ranges between 50 and a few hundred kilometers.

The SS–21's, 22's, and 23's are very effective and, in fact [deleted].

So, the survivability of our theater forces is [deleted] deficiency across the board, and it is not just in terms of weapon systems. It is in terms of command and control, surveillance systems, the entire array of things that one really has to have to pursue a war when threatened by the Soviet forces.

That concern for survivability is one of the things that conditions our view quite strongly about the utility of nuclear artillery. Nuclear artillery tubes are present in such numbers that it is impossible to distinguish a tube which can fire a conventional round from one which can fire a nuclear round. So in order to achieve their end, in effect destroying all our nuclear capability, conventionally if they can, the Soviets would need to target literally thousands of systems if we have an effective nuclear artillery capability.

Today, however, we have a rather [deleted] nuclear artillery capability. As you know, both rounds are old. We know that the Soviets in fact, because its yield is so [deleted].

Therefore, they really don't have to [deleted]. If we were to deploy a modernized version of the 155, it would [deleted] of nuclear units they would have to find, target and destroy in order to believe that they could proceed with some chance of success.

MODERN WEAPONS

Senator WARNER. Define modern weapons because the previous witness, SACEUR, talked about two types of 155's; you know the combination [deleted] I think at this point in the record you ought to explain that.

Dr. WAGNER. Thank you.

I should simply step back a half step farther and say that the current round is the W48 which was developed in the fifties, starting deployment in the early sixties. It has less than [deleted] of yield, a rather short range and is [deleted].

Senator WARNER. Give that range.

Dr. WAGNER. That range is about [deleted] kilometers.

Senator WARNER. In addition to the deficiencies you have mentioned, I understand it has an [deleted] problem.

Dr. WAGNER. It is [deleted] accurate. In order to achieve the best accuracy the nuclear projectile should be ballistically similar to standard HE projectiles or use of a spotter round is required. The W48 is not ballistically similar to standard HE rounds and no spotter round was developed, so accuracy [deleted].

It is in contrast to those deficiencies that new round should be viewed. The new round, the W82, which unfortunately cannot be entered into the inventory until late [deleted] or early [deleted] because the Department of Energy was denied appropriations last year.

That round has the improved safety and security features. It is much more accurate because of improved fusing and it is ballistically similar to current standard HE rounds. Its range is somewhere between 20 and 30 kilometers, depending on whether a rocket assist is used on the projectile, and its yield is [deleted] times the current round, up around [deleted] if it is used in an [deleted] version.

With its [deleted] it has up to the equivalent of about [deleted] in terms of effectiveness on the battlefield, which is about a [deleted] times the equivalent yield of the current round.

Now, they way the round is configured there is a [deleted] round that will produce about [deleted]. You can literally [deleted] which would then achieve the [deleted] but with a range [deleted] still substantially greater than the [deleted] kilometers of the current round.

If you remove the [deleted] and screw on the rocket motor, then it achieves the roughly [deleted] kilometer range.

So, it is a dramatic improvement over the current capability.

Senator WARNER. [Deleted.]

Dr. WAGNER. Yes.

Senator WARNER. It has some physical effect?

Dr. WAGNER. It takes the [deleted] which is intrinsic to the round and uses it to [deleted] which produces about [deleted].

So that what you have its [deleted] but the effective radius of the round with the [deleted] is as if it were about [deleted].

So you can think of it as the current round [deleted]; the [deleted] new round, about [deleted], and the [deleted].

Now, just to finish briefly, the great values that we see are the improvement in effectiveness coming from the characteristics we have just discussed and the improvement in survivability that would come from the fact that the Soviets would have to find and target [deleted] times as many nuclear-capable systems.

Now, I should add that we understand, as Mr. Perle mentioned earlier, that there is [deleted] in deploying these weapons to Europe today. However, we feel that even if not deployed to Europe, they will have a significant deterrent effect. I think it would be very much unlike the Soviet war planners to proceed on the basis that we could not get those weapons to Europe during the buildup to a war, or in fact during the early stages of a war, probably without them knowing it. Therefore I think they will credit us in their war plans with the capability of having those weapons deployed.

Senator WARNER. Let us subdivide that.

Would it be your understanding that the [deleted] would enable us to deploy with our NATO forces the weapons [deleted].

Dr. WAGNER. We could certainly do that. I suspect that it would be easier to do that than to try to do it with the [deleted].

Senator WARNER. It seems to me there are three steps:

1. Stay where we are with the present inventory of 155's.

2. Ship over the new 155's [deleted].

3. Ship over the entire package, the new weapon and the [deleted].

Why don't you take those scenarios and tell us which we should follow.

In fairness to you, General Rogers urges that we not, using his phrase, drag this issue across the trails of NATO at the very time we are trying to conduct the INF discussions. He wasn't specific on the division of the weapons, the three options, I don't believe.

Dr. WAGNER. Could I interject——

Senator WARNER. I think he left the [deleted] at home.

Dr. WAGNER. There are two points I would like to make to clarify the situation.

One is to say again that the 155 will not be available for deployment until well after the [deleted] issue is behind us, I trust, [deleted].

The other, Senator Warner, is to observe that we can't stand still with the current 155 round for the reason that our NATO allies are converting their 155 tubes to an improved version which will [deleted]. They are counting on us to have [deleted].

Senator WARNER. The conclusion is that the [deleted] that would cause the problem is not coming on until [deleted].

Dr. WAGNER. That is exactly right.

Senator WARNER. So, really, practically speaking it does not conflict with the talks assuming we can have some resolution in that timeframe.

Is that a fair summary?

Mr. PERLE. I would think that is right. Mr. Chairman. General Rogers' concern has been that we not become mired in unnecessary controversy. The deployment of the improved round [deleted] we would think would avoid the sort of debilitating controversy that he is con-

cerned about and still keep open the options for the future. But this is something that we are looking at very closely.

Senator WARNER. We are making a good record. If you can pick up after the interruption and continue, Dr. Wagner.

Dr. WAGNER. That is really all I wanted to say in general.

Senator WARNER. Do any of the service representatives wish to add a comment?

General WATSON. I would like to add a point if I may, Mr. Chairman.

155 WEAPON SYSTEM

From the standpoint of the Army in looking at the impact that this weapons system, the 155 weapon system, will have, I would like to share with you our concerns about the current round and its antiquity as well as its [deleted] in its current configuration. First, sir, when we examine Soviet training exercises we see that they [deleted] this weapon system even though we know that nuclear delivery systems are their top priority target.

Senator WARNER. That confirms the [deleted] of the system in the eyes of the planner?

General WATSON. Yes, sir.

A second point is, sir, that we have been able to share some of the Soviet's perceptions of how effective this round is in denying them their objectives, their military objectives.

I would make this point by citing a recent study that [deleted], sir. Looking at the current 155 round and shooting that round at one of their tank battalions, a breakthrough attack in formation [deleted] the round credit for disabling [deleted].

When [deleted] considered the modern round with its [deleted] capability, [deleted] that round credit for disabling [deleted] in the same formation. In [deleted], sir, they can't win under those circumstances.

So, what the modern 155 millimeter [ER round] does is cause them to reevaluate their own tactical doctrine. It causes them to have to disperse on a much wider front in order to avoid presenting a lucrative target. Therefore, it creates other problems for them in terms of being able to mass their artillery and their tanks and their combat power in those narrow channels that their doctrine calls for.

So, the weapon has significant impact on the Soviet's perception of their being able to win in a conventional mode, sir. It represents therefore, a rather important deterrent.

I would also reinforce the point that Dr. Wagner made. In looking at the number of nuclear capable cannon in NATO, we have over 5 times as many 155 tubes as 8-inch tubes. So, it rather substantially complicates their targeting problem and they will have a much more difficult time of locating and neutralizing these systems.

The third point is that the new round is required to capitalize on an improved nuclear delivery capability among our allies, because their new 155 millimeter systems [deleted].

Senator WARNER. I am going to step out for 3 minutes. I want this hearing to continue. I want to prepare in this record the material I need to really wage battle with the Appropriations Committee.

Mr. PERLE. I am due at a luncheon on the House side on the nuclear freeze.

Mr. GAFFNEY. How soon?

Mr. PERLE. Now. I don't mind getting there late.

Mr. WAGNER. I am good for a long time.

Mr. GAFFNEY. There are one or two questions that we might have, Mr. Perle, if we can.

INTERIM ACCORD PROPOSAL

Going back to the interim accord proposal, is it your sense that there are practices that might be involved, not evident at the present time, but that would very quickly become apparent should such a proposal be put forward with respect to negotiating amongst our allies or in effect renegotiating the December 1979 agreement?

Have you had conversations with the allies on this subject and what feeling do you have?

Mr. PERLE. I think it is clear that if we were to achieve an agreement with the Soviets that provided for fewer than 572 weapons, [deleted].

As a matter of fact, if the number agreed upon were to be on the order of, say, [deleted], I suspect we would hear the argument [deleted].

The problem we face in coming up with an interim proposal is that the [deleted].

One of the popular candidates for that is the idea that with the Soviets refusing to accept zero, and our plan calling for 572, [deleted].

One of the problems I see with that as a proposal is that [deleted].

To those ladies who are surrounding Greenham Common in the United Kingdom it does not matter whether the [deleted].

What they care about is what is coming in Greenham Common at the end of the year.

In a sense a proposal on the order of [deleted] could have precisely the opposite political effect from what those who are urging us to make a new proposal are hoping for which is a [deleted]. Therefore we have been thinking hard about proposals that would genuinely improve our situation, that would demonstrate that we are indeed reasonable and flexible, [deleted].

If we are not careful, we will make matters worse.

Senator WARNER. By an interim proposal?

Mr. PERLE. That is right. It has to be a skillful proposal and in our judgment it has to be a sound proposal from a military sense which [deleted].

Mr. GAFFNEY. General Rogers indicated firmly that his view was you had to have the [deleted]. Is that your sense as well?

Mr. PERLE. Yes. The point about the [deleted].

The most important thing about the [deleted].

Moreover, the political consequences of the [deleted] would be quite severe. I have seen reference in recent days to reorganization in which [deleted].

Mr. GAFFNEY. Another point that General Rogers made was a concern in closed session in which he indicated profound reservations about the possibility that [deleted].

Is it your sense that the administration will keep uppermost in mind as it goes through this drill [deleted].

Mr. PERLE. I think we are aware of the [deleted]. There is a political dimension in this particular case which has tended to overshadow military considerations.

I think that was evident even in the original decision to deploy 572 weapons which was decided upon after a [deleted]. It was clear that 572 was the [deleted]. So, from the outset this program has had a political dimension. It has a coupling effect, we believe, uniting the U.S. strategic deterrent to the short-range weapons in Europe by constituting a link in the chain of deterrence and we think that political coupling effect is an important one, as Chancellor Schmidt gave when he first raised the issue in London in 1977.

So, our policy will inevitably include both political and military considerations.

ADMINISTRATIONS POSITION ON THE INF TALKS

Mr. GAFFNEY. Can you give us a sense of the administration's position with respect to the INF talks, and how such systems as the SS–22's might bear upon possible Soviet circumvention of any limitation we could effect on the SS–20?

Mr. PERLE. Yes, we have been very concerned about this substitution potential from the very beginning. We have seen the substitution phenomenon before. The SS–20 is one example.

The Soviets began substituting SS–20's for SS–11's after the SALT I agreement put a cap on the number of launchers for ICBM's. Because SS–20's were not covered by the agreement, we began to see their proliferation. We would not like to see that happen with the SS–22 which has a range of just under 1,000 kilometers and can cover many of the targets that we presume they have assigned to their SS–20's.

Therefore, we have proposed a limit at the levels that were in effect when the negotiations got underway on the number of SS–22's and SS–23's.

Mr. GAFFNEY. Is that an integral part of the zero option?

Mr. PERLE. It is an integral part of our proposal. I would [deleted].

ALCM TECHNOLOGY TRANSFER

Mr. GAFFNEY. Could you explain your earlier remark about the fact that the Soviets appear to have acquired the ALCM technology from the United States? Is that a technology transfer case or some other matter which has not previously come to the attention of the committee?

Mr. PERLE. It is a very unfortunate technology transfer. We believe the Soviets have acquired the [deleted] technology by espionage. As one looks at the array of technologies involved in the production of highly accurate cruise missiles, we find a number of technology areas in which the Soviets have been the recipient of Western technology, microelectronics particularly, sensors, computer capability and the like.

REDUCING ACCESS TO WESTERN TECHNOLOGY

This is why we have laid such stress on finding ways to reduce Soviet access to Western technology. A gap that was believed to be on the order of 10 years in cruise missile technology has now been narrowed to a couple of years and that is due largely to Soviet acquisition of Western technology.

Mr. GAFFNEY. Above board or covert?

Mr. PERLE. A combination of equipment purchased legally, equipment stolen, and blueprints and design data and military hardware acquired through espionage.

When you put it all together it has represented a formidable transfer of technology.

MODIFICATION IN STEPDOWN SOLUTION

Mr. RENEHAN. Mr. Secretary, you said during the open session that you would like to see modification in the stepdown solution.

Would you care to discuss briefly what those modifications are likely to be?

Mr. PERLE. Let me give an example of the problem I see with the stepdown solution, as you termed it. We are deploying ALCM as a consequence of increases in Soviet air defense capability. ALCM's will increase the ability of B–52's to penetrate the Soviet air defenses and to survive. If we have to remove from the inventory [deleted] nuclear warheads for every ALCM deployed, we would either have to alter the program on the deployment of the ALCM or make very substantial reductions elsewhere.

I don't think that was the intent of the builddown concept. So, if it were not applied as a universal law even in those areas where the burden that is placed upon us is a consequence of a buildup that has already taken place on the Soviet side, then there might be ways that the concept could be incorporated in a legislative vehicle, perhaps something along the lines of resolutions introduced by Senators Warner and Jackson in an amalgamation that would contain three important concepts, the essentiality of modernization, the desire for reduction and the approach to building down.

I can see a quite constructive piece of legislation that would result from that amalgamation.

Dr. WAGNER. I would like to add one caution to the builddown approach, which is that we do not know [deleted].

If, as you start to trade in old ones, you begin to invade the regime of systems that are dual capable systems for which the verification is extremely difficult, you may well end up with the United States having substantially reduced the numbers of weapons in this unverifiable regime and the Soviets having a much greater number compared to the number we have than the disparity is today.

Mr. PERLE. You might therefore wish to count other than warheads. This is why we sought to make the point that the problems with the concept, depending on how it is applied, could be insurmountable. Applied in other ways, it might be workable.

Mr. GAFFNEY. Mr. Secretary, if you want to excuse yourself, I think we can ask the indulgence of the other witnesses and press on a bit and try to flesh these issues out the record.

Thank you very much for your participation.

Mr. PERLE. Thank you very much.

Mr. GAFFNEY. I would like to ask Jim Smith if he has any questions?

NUCLEAR ARTILLERY

Mr. SMITH. Let me try to clarify the record on the nuclear artillery question. Let us do that by going to the current 8-inch round that you are producing.

What is the status of the new 8-inch round, the W79?

Dr. WAGNER. It is being produced today. At the end of this fiscal year we will have nearly [deleted] of them. It is being produced, pursuant to a decision of the President, in the enhanced radiation mode. It is being stockpiled in the United States.

Mr. SMITH. Is there any intention to deploy this round in Europe at this point in time?

Dr. WAGNER. We do not have plans to deploy it in Europe at this time.

Mr. SMITH. Is there any intention to approach the allies about deploying that round at this point in time?

Dr. WAGNER. None at this time.

Mr. SMITH. And why?

Dr. WAGNER. Simply because of what we believe the political sensitivity would be during this very sensitive next year, and also because we feel that the round does have substantial deterrent affect even if stockpiled in the United States.

Mr. SMITH. If I could summarize, you are producing 8-inch rounds in the ER version and you are stockpiling them in the United States. You have no intention at this point in time to deploy that round in Europe, but you feel that the deterrent capability, the deterrent enhancement that you derive from producing and stockpiling this weapon in the United States is significant and is worth doing?

Dr. WAGNER. Yes, sir, I believe it is.

Mr. SMITH. Let us translate that into the situation with regard to the 155, the W82. You previously indicated that you could not produce the first W82 round until the [deleted] timeframe.

Dr. WAGNER. Or early [deleted].

Mr. SMITH. At this point in time?

Dr. WAGNER. That is right.

Mr. SMITH. In order to produce the round in [deleted], you need certain funding in fiscal year 1984. Can you identify that funding, how much and for what purpose?

Dr. WAGNER. It is DOE funding. The number is around [deleted] million. The second significant figure is [deleted] million.

Mr. SMITH. Is there money in the defense budget for fiscal year 1984 for the 155 system?

Dr. WAGNER. There is some money in the 1984 budget. It is around [deleted] million. I don't have the number exactly.

General WATSON. [Deleted] in this budget.

Mr. SMITH. And for what purpose?

General WATSON. When the 1984 budget went forward it contained a total of [deleted] for procurement. However, that budget was built and could not be recovered because of the lateness of the fiscal year 1983 DOE CRA. It was our intent to only convey to you a need for [deleted] and that is to buy the long lead DOE training components and other equipment that we would need to move into production.

Mr. SMITH. You are now in shortfall in the 1984 budget to make that [deleted] timeframe?

General WATSON. [Deleted.]

Mr. SMITH. Maybe you can clarify that slightly for the record because that is still not clear in the record what the funding situation is.

Let me not dwell on it now though.

General WATSON. We will be glad to submit those for the record.

[The information follows:]

FUNDING SHORTFALL

The Defense budget is adequately funded in 1984 for the 155mm nuclear projectile, W82. The Army has [deleted] in RDTE which will maintain the program in excellent shape to begin production in the [deleted]. The DOE was not capitalized for production facilities in their fiscal year 1983 weapons production CRA. This has caused a one year slip in the IOC to [deleted.] The CRA specfically provided for continued RDTE, so the Army has continued RDTE to eliminate all concurrency from the program. However, the Army budget for long lead procurement, [deleted] in fiscal year 1984, was not changed in the defense budget to reflect the one year slip in IOC, creating the situation we have now of an overstated procurement line for the W82. Because of the one year slip in the IOC, our long lead procurement needed in fiscal year 1984 is only [deleted] so we are seeking, through congressional committees, to move [deleted] into our tank training ammunition account, which is also a critical need. In order to meet the [deleted] the DOE requires the [deleted] fiscal year 1983 supplemental funding and $2.5M in their fiscal year 1984 budget submission; both to capitalize production facilites which require long lead times to complete.

Mr. SMITH. Senator Warner said you appeared to have two options.

One option would be to build and deploy a [deleted] version or to build and deploy an [deleted] version.

There is a third option which is to build the system and not deploy it, which is exactly what you are doing with the 8-inch warhead.

Is that not an option at this point?

General WATSON. For the 155 mm round it certainly is an option. That is a [deleted] and those [deleted] could be deployed very quickly with a very small airlift requirement.

I would like to go back, sir, and clarify one thing with regard to the W79.

While we do not have any plans to deploy the W79, [deleted].

Mr. SMITH. But you have not produced it in a [deleted]?

General WATSON. We have not produced it and we would have to take new production in order to do that or modify the old production.

Dr. WAGNER. It is a fairly easy conversion to begin to produce it in the [deleted] mode.

I should add that we may have made the non-forward deployed case sound a bit too attractive. It would be desirable to forward deploy this weapon as well as the 155. It is simply that we feel that the weapon is by no means a waste if it is not forward deployed and this year

and perhaps next year the political burden that it would add to the alliance of trying to undertake that deployment would simply be as great as it is today.

Mr. SMITH. The difficulty of deploying a [deleted] version will be almost as difficult as employing the [deleted] version because you can't tell the difference between the two rounds. I don't know how you get around the political problem. Maybe you can speak to that in some detail for the record.

Why would the allies be content to agree to the deployment of the [deleted] version when you can't tell the difference between the two rounds unless you have a technically trained individual doing the examination?

Dr. WAGNER. Your point is correct and the distinctions are not very great between the two rounds.

I would like to add one or two points on nuclear artillery. I think there is a misperception that nuclear artillery is inordinately expensive.

In particular I have seen great cost attributed to the 155, incorrectly attributed to it. If you look only at the warhead cost, the part that the Department of Energy funds, it is true that nuclear artillery projectiles are among the more expensive in the range of warhead cost. However, if you look at the total system cost, the DOD and DOE cost and especially if you look at a 10-year cost, nuclear artillery is a bargain because the delivery tubes and the infrastructure that goes along with them are there anyhow for the conventional purpose.

It turns out that if you look at those costs per unit effectiveness against the adversary, nuclear artillery is among the least expensive ways of deterring the Soviets.

One final point about the 155, and that is that the development is well along. It is clearly a feasible development. It has a few continuing development problems, but they are not much different from the kinds of development problems that one encounters in any ultimately successful nuclear weapon development.

Mr. GAFFNEY. On that point could we go back to the 155 in the context that General Rogers described it, and I don't believe you gentlemen were in the room at the time, but we talked about some uncertainty on his part with respect to the total force levels that he envisions having to have in the future in Europe to meet requirements.

He talked about the fact that he was engaged in a review of the requirement, and anticipated it might be several years before assessing those requirements for the future would be completed, and in the meantime he suggested doing nothing more than perhaps entering into a [deleted] production rate for the 155.

Could you comment on your perspective with respect to his ongoing study of requirements and his recommendations?

Dr. WAGNER. I would like to say one word and turn it over to General Watson.

That is that, of course, again the production will not start for [deleted]. So these assessments [deleted] before the 155 production starts. I would be extremely surprised if they concluded that no 155s were needed.

My second point is that these kinds of assessments have to take into account the survivability question, and it is not clear to me whether

or not General Roger's assessments take into account the added number which you have to start with, so that you will have the right number after the Soviets have attacked and partially destroyed your stockpile.

Let me turn to General Watson now for some additional comments.

General WATSON. We are in the process of doing a study on what those requirements will be in the near term. We haven't completed those efforts, but I can tell you at this point that in looking at the requirement from the standpoint of the Soviets and trying to analyze the requirement from what they perceive as a deterrent, it does look like we will continue to have a requirement on the order of magnitude we have today, which is a high risk minimum stockpile, but reduced somewhat because of the modernization which yields increased military effectiveness.

I do not believe that we see any indication of any type of large deviation from the levels that we are at now for the high-risk force.

What we have in this study is a reaffirmation I think that at the levels we have today, we are at a somewhat high risk. By that I mean that we are on the borderline of what it takes, according to the Soviet perception, to stop their conventional attack.

While you will see changes brought about as a result of improved efficiencies, you are not going to see any substantial deviation in inventory.

SAFETY, SECURITY, AND SURVIVABILITY

Mr. GAFFNEY. The chairman asked me to make sure that we put into the record, and I think it would be helpful to have comments and you can elaborate it if you will, Dr. Wagner, on safety, security, and survivability programs that you have been very much concerned about personally.

Could you give us an update on where we are with that program today and any thoughts that you might have as to what this committee might do to try to advance that program?

Dr. WAGNER. There are several parts to the safety, security, and survivability program. I should say to begin with that the reason we coupled the three characteristics is that survivability is generally largely conditioned for theater weapons by the basing mode, just as it is for strategic weapons, and the basing mode itself in turn is driven by safety and security requirements.

So, they are coupled. The program has several parts. The first part is to build advanced safety and security features into the weapons themselves as they are developed and then delivered to us by the Department of Energy.

That is one of the reasons why we need to modernize the stockpile. Since these improvements are so very much built into the weapons, if we were to stop modernization because of a freeze, we would not be able to add many of these safety and security features.

However, the modernization program will take quite a number of years at best and it will not be until well into the nineties that all of our theater weapons will have the advanced safety and security features.

Mr. GAFFNEY. That assumes that the modernization program goes forward in the President's program. Were it not, you would either not see that safety program fully implemented or take place at some later date?

Dr. WAGNER. That is right. The remaining parts of the program have to do principally with the Department of Defense. There are two DOD parts to the program.

One is a survivability program itself which embodies a number of the things that you have heard discussed here this morning in terms of deployment of new intrinsically more survivable systems such as the 155, the Pershing, and GLCM.

But there is a whole host of additional measures which cover the whole range of activities in the nuclear forces in Europe, ranging all the way from the ability to be able to disperse the weapon quickly to a more survivable posture during a crisis, to techniques for reducing the signature so that they are less easy to acquire by the enemy's target acquisition systems.

Most of those survivability improvements are embodied in not a single program, but in the individual line items across the whole spectrum of DOD programs. They never get focused on in that regard, but they are a very important part of the entire theater modernization program.

The other DOD part of the program is, in fact, a well focused one. It has to do with measures to improve the security, the physical security, at nuclear weapon storage sites overseas. This is a program which is largely funded through the NATO infrastructure.

It was accelerated by the Congress some years ago when the Congress agreed to prefinance the acquisition of the improvements at the storage sites, better fences, better light towers, things like that.

WEAPONS ACCESS DELAY SYSTEM [WADS]

The issue in the budget today, and it is carried in the Army budget, is a program called WADS. WADS stands for Weapons Access Delay System.

The Army is carrying some $35 million in the 1984 budget for WADS. WADS is a set of devices which can be installed in the storage bunkers, devices such as concertina wire which drapes down over the weapons, smoke generators which would be triggered if an intruder were to enter a bunker, loud noise generators which would inhibit the intruder's ability to function inside the bunker, improved locks, changes around the bunker door—a set of devices which would make it very difficult for an intruder, even if he got up to the bunker door or succeeded in getting into the bunker, to actually remove a weapon.

We feel that more than anything else we can do, the WADS system can provide, in effect guarantee, that a terrorist can't steal a weapon.

We present this to the Congress in the spirit again of a prefinancing of what will ultimately, we believe, be a NATO infrastructure funded program. But in order to short circuit the very cumbersome NATO approval process, which for a program like this can probably be expected to take 2 or 3 years, we would like to accomplish

precautionary prefinancing so that we can get started on it and have it in the field by [deleted].

Mr. GAFFNEY. What percentage of the force will you be able to protect that way with $80 million?

Dr. WAGNER. $80 million would cover [deleted] in both CONUS and in Europe. In Europe, that comes to perhaps order of [deleted] individual igloos. There is an Air Force program which has somewhat different characteristics, different kinds of hardware which is coming along about a year later and the Navy has an even smaller set of requirements and will come along, I believe, with its own special program also about a year hence.

Mr. GAFFNEY. I assume there is a good reason why each Service has to have its own approach to the problem?

Dr. WAGNER. The storage sites themselves are physically different. For instance, the Air Force weapon storage tends to be on large bases where the response forces are more readily at hand, and therefore we would not need to outfit each individual igloo at the operating base with many of these devices as we would for a very remote Army base which is much more exposed.

Mr. GAFFNEY. Admiral Holland, least you feel neglected, that your time has not been well spent here this morning, can you give us a sense as to what is happening in the Navy that will give this committee confidence that indeed it is taking prospects of having to fight a nuclear war at sea seriously and putting into its budget both now and in the future the resources that are required for protecting ships, improving training, greater assessment, greater understanding, if you will, of the problem?

STATEMENT OF REAR ADM. W. J. HOLLAND, JR., U.S. NAVY, DIRECTOR, STRATEGIC AND THEATER NUCLEAR WARFARE DIVISION, OFFICE OF THE CHIEF OF NAVAL OPERATIONS

SHIP SURVIVABILITY IN A NUCLEAR WAR

Admiral HOLLAND. I don't have the dollar figures. Ship survivability, of course, is a significant issue in the Navy shipbuilding budget this year.

Of most significance is the finding over the past 2 years that it would be difficult and expensive to backfit old ships to allow them to survive in a very drastic nuclear environment. However, new construction and about seven classes of the most modern or the most recent construction ships will be modified by various methods, both for blast-hardness and electromagnetic pulse.

In order to begin such a program the Navy has to undertake a good deal of test and evaluation which the committee has been a consistent supporter of for many years. We are proceeding now to build a larger test facility for large ships. We will get the testing done for the aircraft that we need to test.

From those tests we will be able to do some of the prototype and development work in order to improve the fleet's ability to operate in a nuclear environment.

None of that can be done quickly or instantly, but it is proceeding apace.

Mr. GAFFNEY. How long do you think we are talking about before we will see the introduction into the fleet in any numbers ships with such hardening?

Admiral HOLLAND. [Deleted.] You don't get it very fast because you don't build lots of ships.

Mr. GAFFNEY. I guess I am asking a philosophical question. Do you believe the Navy leadership is today persuaded that they have a problem in this area?

Admiral HOLLAND. Absolutely.

Mr. GAFFNEY. And they are taking every appropriate step in finding the resources necessary to make the adjustment of the current fleet posture to fix the problem?

Admiral HOLLAND. Yes.

Mr. GAFFNEY. Thank you.

Mr. RENEHAN. A specific question in that regard.

Has the Navy tested and are they sure that they have hardened their own standard missile with the nuclear warhead?

Admiral HOLLAND. No.

Mr. RENEHAN. No, you haven't tested or no, you are not sure?

Admiral HOLLAND. Yes, that is right, we have not tested. If we haven't tested, we are not sure. We have not built the weapon yet. We are not going to know that until we have built the weapon.

Mr. RENEHAN. But EMP, to that degree you have not done any testing?

Dr. WAGNER. I might point out there is a technical point here. The EMP from the [deleted] warhead is probably not as widespread as the standard view of a high altitude burst which covers from horizon to horizon. The range of the [deleted] is long enough so that any close EMP, short-ranging EMP, would probably not impose a field on the launching ship that we think of with high altitude.

Mr. GAFFNEY. Would that be true for systems like Aegis as well?

Dr. WAGNER. Yes.

Mr. GAFFNEY. Is the Aegis designed to be EMP hardened?

Dr. WAGNER. Yes.

Mr. GAFFNEY. Where are we on the SM–2 in terms of the decision to proceed with development?

Admiral HOLLAND. Funded. The hardware is coming right along, but the problem we have most apparent and immediate to us in the Navy is to build a battle management system that allows us to employ it intelligently.

Mr. GAFFNEY. Where are we on solving that problem?

Admiral HOLLAND. We have started. That is going to take a while to figure out how to do that.

Mr. GAFFNEY. Is that simply a software problem or larger conceptual problem?

GRAY WEAPON PROBLEM

Admiral HOLLAND. It is conceptual. You heard General Rogers this morning discuss the gray weapon problem. The gray weapon problem is when you see an incoming flight of aircraft or missiles, how do you

know it is nuclear? How do you know if you should use nuclear weapons? When should you? Under what circumstances? Not only do you have political rules of engagement, but military rules of engagement.

How do you play it off against your magazine capacity? How many weapons are available to you? It is a significant study problem that we have to come to grips with.

It will probably take you 2 years to get ready for the introduction of the weapon, to try to figure that part of the problem out, given all of the constraints that are on it in a fleet operating environment.

RELEASE AUTHORITY REGARDING NUCLEAR WEAPONS

Mr. GAFFNEY. Under the present rules of engagement what sort of release authority is required for making use of any of your existing nuclear weapons?

Admiral HOLLAND. The President of the United States has to make that decision.

Mr. GAFFNEY. Is that factored in your present battle management structure such that you get in engagement time release authority?

Admiral HOLLAND. I don't think it is realistic, but it is factored in.

Is it realistic? I don't think so. We have not come to grips with that part of the problem. We keep trying.

Dr. WAGNER. I would like to address that release problem a bit.

With a nuclear warhead for the SM–2's, the price of attacking a battle group with Backfire bombers, which is the principal threat for which the SM–2 is designed, is raised to a substantial factor, three or four. It is raised to the point where the Soviets probably don't have enough Backfires, and probably won't, to be able to attack all the battle groups that they might want to attack simultaneously, even if they work out the command and control and timing. [Deleted.]

Mr. GAFFNEY. How well do we believe the Soviets understand the battle management problem with respect to nuclear war at sea? We credit them I believe with a fairly well-integrated nuclear capability.

Admiral HOLLAND. That is correct. How well do they do it? I am not sure how to answer the question.

Mr. GAFFNEY. From what intelligence tells us about their training, their doctrine, their hardware capability and so on?

SOVIETS INTEGRATE NUCLEAR WEAPONS

Admiral HOLLAND. They integrate nuclear weapons in their normal training operations just as they do ashore, just as General Rogers described earlier this morning in the session I hear him talk about.

They do that at sea as well. They have strict and structured command and control arrangements. Whether that makes them more efficient in handling nuclear weapons, I can't say.

Mr. GAFFNEY. To put it in a different way, what would your assessment be of their capability today, both with respect to release author-

ity and actual ability to operate in this environment and to execute an attack utilizing these weapons in such a way that it did not shut down their own systems?

Admiral HOLLAND. I don't know.

Mr. GAFFNEY. You can't answer the question?

Admiral HOLLAND. I don't know.

Mr. GAFFNEY. Does somebody else know on our side?

Admiral HOLLAND. [Deleted.]

Mr. GAFFNEY. That reflects the current understanding?

Admiral HOLLAND. Yes, sir.

SEA-LAUNCHED VERSUS GROUND-LAUNCHED CRUISE MISSILE RELIABILITY

Mr. GAFFNEY. General Callaghan, to give you a measure of equal time, could you describe for us, in view of the difficulties that we understand the Navy has had with quality control and reliability in the sea-launch cruise missile, if there has been any apparent carryover in the ground-launched cruise missile program?

STATEMENT OF BRIG. GEN. J. T. CALLAGHAN, U.S. AIR FORCE, DEPUTY DIRECTOR, REGIONAL PLANS AND POLICY, DCS/PLANS AND OPERATIONS

General CALLAGHAN. I would prefer to let the Navy discuss any problems that they have with the overall Tomahawk program.

Mr. GAFFNEY. We will get into that in a subsequent hearing. I wanted a progress report.

General CALLAGHAN. It is clear that the results of the Air Force test of the ground-launched cruise missile to date would illustrate that there are no core or complex problems that need to be resolved prior to the operational capability date and operational deployment of the missile and that the problems which have been encountered are explainable and have been resolved.

Mr. GAFFNEY. With respect to quality assurances, with respect to maintaining the proper standard and specs in the GLCM program?

General CALLAGHAN. To the extent that I am aware, our Joint Cruise Missile Planning Office, and the Air Force people who work there on ground-launched cruise missiles, have not informed the Air Force of any such problem.

Mr. GAFFNEY. Could you amplify on that for the record?

General CALLAGHAN. I will be glad to do that.

[The information follows:]

The following Ground Launched Cruise Missile test results are provided in response to a question raised by Mr. Gaffney during testimony to the Senate Armed Services Subcommittee on Strategic and Theater Nuclear Forces on 15 March 1983.

Ten flights were conducted during the Contractor Test and Evaluation (CT&E) and Air Force Test and Evaluation (AFT&E) programs. Seven flights were successful, two were partially successful, and one was a failure. Of the two partially successful flights, one was caused by an oil leak. On the other, the cruise

missile guidance system (CMGS) failed after one hour, with failure caused by a loose screw on the stabilizing platform. On the flight which failed, the air inlet did not open due to the loss of pressure in the pneumatics system preventing the cruise engine from starting.

FLIGHT TESTS

Test event	*Result*	*Comment*
Flight CT&E–1 (5/16/80)	Partially successful	Oil leak; recovered early
Flight CT&E–2 (2/25/82)	Successful	
Flight CT&E–3 (3/25/82)	Successful	Recovery parachute failed
Flight AFT&E–1 (5/19/82)	Successful	No telemetry output after 16 minutes
Flight AFT&E–2 (8/27/82)	Partially successful	Cruise missile guidance system failed after 1 hour
Flight AFT&E–3 (11/12/82)	Successful	
Flight AFT&E–4 (12/17/82)	Failure	Pneumatic system failed
Flight AFT&E–5 (2/23/83)	Successful	
Flight AFT&E–6 (6/7/83)	Successful	
Flight AFT&E–7 (7/27/83)	Successful	

OTHER TESTS

Various extended functional tests (3/82)	Successful	
EMI/EMC/TEMPEST (9/82)	Successful	
Mobility test (12/82)	Successful	
System compatibility (12/82)	Successful	Demonstrated Launch Control Center/Transporter Erector Launcher interface
Dispersal evaluation (1/83)	Complete	Demonstrated field operability/support
Climatics test (6/83)	Complete	Operation verified; minor anomalies

The Follow-on Operational Test and Evaluation (FOT&E)—Phase I program began 1 June 1983. The first test flight in this phase is scheduled for early November 1983.

(Terms explained)

—CT&E—contractor test and evaluation
—AFT&E—Air Force Test and Evaluation
—EMI—electromagnetic interference
—EMC—electromagnetic compatability

EUROPEAN THEATER NUCLEAR WAR

Mr. GAFFNEY. If you could elaborate on this question. We tend in this hearing each year to focus primarily on the European theater and the possibility of theater nuclear war there and the preparations that are being made for the deterrent aspect of our capability there.

I think the admiral has given us something of a progress report. For instance, in the East Asia environment you might give us—I don't know if we are getting outside your bailiwick, but General Watson has to worry about all these various parts—if you could give us a sense of the nuclear balance at the theater level, say, in Korea and what steps we ought to be thinking about with respect to modernizing our deterrence there even as our efforts go forward on the European side.

PACIFIC/EAST ASIA THEATER

General CALLAGHAN. With regard to the Pacific/East Asia region our military commanders who have responsibility in that part of the world are concerned about the time and effort that the Soviets have spent on modernization to include theater nuclear weapons.

That whole issue is under review at this time within the Department of Defense. It is also under review within the Department of State, whose views on this point are extremely important to the process.

I don't know if General Watson may wish to add to my remarks.

General WATSON. Our global responsibilities I think have to take into consideration areas like Southeast Asia, North Korea, et cetera. In looking at the global magnitude we obviously see places around the world I think where a theater nuclear force or a nuclear capable tactical force can deter aggression.

I guess the flexible response that we need is magnified in terms of not only the nuclear capability, once we get there, but also those resources necessary to train and to deploy.

Yes, we are concerned very much with the flexible response of the Army and those systems that we need in order to be able to influence areas of concern around the world.

[Deleted.]

MODERNIZING NUCLEAR DETERRENT

Mr. GAFFNEY. Is there anything underway at this point in the nature of a proposal comparable to that entered into in December 1979, or the preceding discussions that we would be at some point down the road likely to lead to a decision on the part of this country, presumably in conjunction with [deleted], to modernize our nuclear deterrent at the tactical or theater level in [deleted]?

Are any of our witnesses aware of any such discussions? The preceding question should be: Is there need for such modernization really?

I am assuming in my questioning that there is indeed in view of the fact that the same obsolescence that characterizes our tactical forces in Europe characterizes our tactical forces in [deleted].

Dr. WAGNER. We, of course, don't have an alliance which functions in the same way that the Atlantic alliance does. So there is nothing which is on the horizon that would compare to the 1979 decision.

However, for the last 2 years or so, there has been a quite thorough study in the Pacific Command, at the request of Admiral Long of CINCPAC, to look at his requirements for theater nuclear weapons. That study is well along. It was reviewed, I believe, just last week at PACOM. I think it will, during the next few months, result in some concrete proposal for, the initial redeployment of existing assets to strengthen the deterrent in that theater and perhaps later in some modifications to weapon systems.

It is premature now, but I think there is a very nice step underway.

Mr. GAFFNEY. When would we expect to have the results of that study available?

Dr. WAGNER. I would think certainly during the next year, before this time next year.

Mr. GAFFNEY. General Watson?

General WATSON. I guess I would go back and clarify one point. The point I was really trying to make is that as we modernize our nuclear forces for, let us say a NATO scenario, and because of the nature of the global responsibility that the Army has and our country has, we would also be modernizing our force for those contingency areas. I see them as superimposed over one another, and really we are doing both things simultaneously.

I don't see any unique requirement to modernize beyond what we are doing now other than the capability to get our forces to the area in which they are needed.

Mr. GAFFNEY. In other words, you are applying the old swing strategy to nuclear forces and at least the theater nuclear forces and presumably to the extent you are not able to forward deploy some of these systems to Europe that facilitate your ability to relocate should the requirement arise?

General WATSON. And in the study that Dr. Wagner referred to, I don't envision, at this point in time, any new weapon systems growing up out of that study.

What we would be looking at is a distribution of those systems that we currently have or are planning to bring in.

Mr. GAFFNEY. When you say no new systems, you are not precluding the Corp Support Weapon System or any of the other systems that you are currently envisioning as being requirements for future development in the European continent?

General WATSON. That is correct. I am considering those as part of it and I am not precluding them.

Mr. GAFFNEY. Finally, and we certainly appreciate the patience of all the witnesses, let me ask you, General Watson, the continuing resolution, of course, poses certain problems on the Pershing II procurement.

TEST FLIGHT PROGRAM

I wonder if you might, to the extent you can, give us a description of where things stand with respect to meeting the desires of the Congress with respect to satisfying them that the test flight program has performed satisfactorily, and how you are handling the procurement problems that have arisen as a result of a sort of start and stop approach on the part of the Congress last year?

General WATSON. If I may, let me turn first to the test program itself.

There, as you know, the Congress withheld those funds and in so doing stated that they would be willing to release them once we demonstrated successfully that the missile would perform.

We have now completed 6 tests and we have 12 additional tests scheduled. We have tested, both the single-stage and the dual-stage missile. The tests of the functioning of both these stages have been very successful.

We tested also, and feel very confident about, the guidance system on the missile and, as far as we can see at this point in time, we have little or no difficulty with the test program and we think that the missile is performing very, very well; in fact, better than we could hope for, I think, at this stage of our test program.

So, I see no difficulty there in satisfying the congressional concerns about the ability of the missile to perform.

It would seem that we need to make that decision at some point in the near future as to those funds.

Mr. GAFFNEY. How near?

General WATSON. How near in the future do we need? We think that no later than May 15 we have to have a decision, or we are going to have to take some action with regard to our contractors that would cost us some standdown time and restart dollars as a result, and would delay our ability to field the weapon system in the second and third battalions as we start to deploy.

Mr. GAFFNEY. Can you give us a briefing on your status of negotiations with the House Appropriations Committee?

General WATSON. I would have to submit that for the record because I really don't know the status at this point.

[The information follows:]

APPROPRIATIONS

The current status of negotiations with the House Appropriations Committee is that the members have been advised of the flight test results and the Office of the Secretary of Defense has prepared the supplemental funding request. The funding request is now at OMB and I anticipate that it will be forwarded to Congress within the next few weeks.

Mr. GAFFNEY. It is my understanding that the fact that the second stage has shown a reentry problem, if you will, somewhat different from what you would expect it to do, for range safety considerations, you are not able to test-fly the full range overland and that is a sticking point with the House Appropriations Committee.

General WATSON. That is a safety problem. It is not a performance problem. The only safety issue involved is where the metal parts fall, once that part of the missile performs its mission. So, in terms of what I believe Congress intended, I don't look at that as part of that envelope they have described.

I believe it is a safety problem that in time of war would not apply. Where are we in fixing it? Obviously, we want to fix it. We have a study underway. We are looking at it.

The contractor is very near a recommendation as to how to go about fixing it. We have not had a chance to hear him out on his recommendations or to evaluate his recommendations.

Mr. GAFFNEY. From a strict performance standpoint there is no concern in the Army or perhaps Dr. Wagner can address it from the OSD point of view, about the performance, the ability of both the systems to perform as required and the ability that you have demonstrated in your over-the-water test of the system to meet the testing requirements for validating its capability.

General WATSON. That is correct. We are not concerned with its performance, only its range safety related problems in the test firings over land.

Mr. WAGNER. I agree.

Mr. GAFFNEY. Speaking for the committee, I know this has been an arduous exercise, perhaps something of a record even by Chairman Warner's standards. We appreciate most heartily the cooperation of the witnesses. I think it is an excellent record.

Thank you, gentlemen.

[Questions with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN W. WARNER

[DELETED] ABMS

Senator WARNER. Secretary Perle, what does the prospective introduction of mobile [deleted] anti-ballistic missile systems into the Soviet inventory imply for U.S. theater—and possibly strategic—nuclear forces and our arms control policy with respect to ballistic missile defense (for example, the ABM treaty of 1972)?

Mr. PERLE. We are closely observing Soviet developments in the ABM field in order to assess the ABM treaty implications, if any. At the same time, we are continuing our research and development efforts designed to provide counters to ABM systems that become necessary.

SOVIET TNF FIREPOWER

Senator WARNER. Increases in Soviet TNF Firepower: Secretary Perle, a remarkable statistic in the current edition of Soviet Military Power is the fact that since 1977 the nuclear striking power of the Soviet long-range intermediate nuclear force missiles has more than doubled even as the total number of launchers has decreased.

Does that statement take into account missile reloads for the SS-20?

Mr. PERLE. No, it does not. We assess the Soviets to have at least one refire missile per launcher. Since the additional SS-20 refire missiles also have three warheads per missile, it would increase their overall firepower even more significantly.

FORWARD-BASED SYSTEMS

Senator WARNER. Secretary Perle, provide a comparison both numerically and qualitatively of Soviet versus American "forward based systems (FBS)."

Comparison of Soviet and U.S. land-based LRINF missiles and nuclear-capable aircraft based in Europe.

Soviet Union as of March 1983 LRINF missiles on launchers:	*Warheads*
SS–20 (351)	1,053
SS–4 (232)	232
SS–5 (16)	16
Total (599)	1,301

United States LRINF missiles on launchers: [1]	
GLCM	0
PII	0
Total	0

Soviet Union as of December 1981 INF aircraft in Europe: [2]	*Aircraft*
Badger	550
Blinder	200
Fencer	300
Beagle (IL–28)	650
Brewer (YAK–28)	30
Foxbat (Mig–25)	100
Fishbed (Mig–21)	1,050
SU–25	0
Fitter (SU–7)	500
Fitter (SU–17)	650
Flogger (Mig)	2,300
Total	6,300

United States INF aircraft in Europe: [3]	
F–111	165
F–16 [3]	0
F–4	235
Total	400

[1] Under NATO's 1979 decision in the absence of a concrete arms control agreement the U.S. will deploy 108 PERSHING II and 464 ground launched cruise missiles (GLCMs) to Europe beginning in December 1983.
[2] Nuclear capable aircraft including aircraft not assigned to combat units.
[3] A small number of F–16s have replaced F–4s since December 1981. Total numbers remain essentially the same.

[Deleted.]
[Deleted.]

With respect to qualitative comparisons, the new SS–20 missile is far superior to the older SS–4s and SS–5s. The accuracy and reaction time are greatly improved and the SS–20 has three warheads versus one for the older systems. In addition, the mobility of the SS–20 along with its increased range increases greatly its survivability. The SS–20 has twice the range of the US GLCM and almost three times the range of the PERSHING II.

While it is very difficult to compare US and Soviet aircraft because of the geographical advantages which favor the Soviet Union, it is safe to say that the Soviet Union's Frontal Aviation has been the focus of comprehensive modernization and reorganization programs. The upgrades to the FENCER, FLOGGER and FITTER aircraft have had a particularly profound impact on Soviet offensive capabilities. The FENCER with its all-weather, low-attitude penetration capability increases greatly the Soviet's ability to carry out deep strikes into NATO territory with little warning. By contrast the US and Allied upgrading of NATO aircraft has been limited numerically (F–16s, Tornado) and while comparable in quailty, NATO aircraft are greatly outnumbered by the Warsaw Pact.

Overall, the Soviet modernization program has been much more vigorous than that of the US and NATO, and the former qualitative advantage which we once enjoyed is eroding rapidly.

SS–20 DEPLOYMENTS

Senator WARNER. Secretary Perle, can you provide us with the number of SS–20 ballistic missiles deployed in the Soviet Union and targeted against

Western Europe at the time of the December 1979 NATO agreement on LRINF? What is the equivalent number today? In addition, how many systems have been fielded whose targets lie outside Western Europe?

Mr. PERLE. At the time of the December 1979 NATO decision, there were [deleted] SS–20s deployed, of which [deleted] were targeted on Europe. Today, there are 351 SS–20s deployed, of which [deleted] are targeted on Europe and [deleted] are in the Soviet Far East. However, it must be noted that because of their mobility and transportability, SS–20s are a threat to Europe or Asia wherever located.

SS–20 RELOCATABILITY

Senator WARNER. Secretary Perle, how far east of the Ural Mountains can Soviet SS–20s be deployed and still be in range of critical NATO targets? Do you have an estimate of how long it would take SS–20s based for attack upon targets in East Asia to be relocated so as to be within range of principal European high-value targets?

Mr. PERLE. SS–20s as far east as Mongolia can still hit NATO territory. [A Secret/NOFORN insert is being provided under separate cover to answer the second part of the question.]

NORTH ATLANTIC ASSEMBLY REPORT

Senator WARNER. What is the relationship between the North Atlantic Assembly and the North Atlantic Treaty Organization? Does the forthcoming report, which it is said will call for unilateral reductions of U.S. tactical nuclear weapons from Europe going, in any way, to represent a formal decision on the part of the alliance?

Mr. PERLE. (a) The North Atlantic Assembly is the interparliamentary organization of member countries of the North Atlantic Alliance, founded in 1955. Its aims are to strengthen cooperation and understanding among Alliance countries, to encourage governments to take the Alliance viewpoint into account when framing legislation, and to encourage a common feeling of Atlantic solidarity in national parliaments. It provides a forum for North American and European parliamentarians to discuss problems of common concern, and it constitutes a link between parliamentarians and the Alliance.

The North Atlantic Assembly is, however, completely independent of the North Atlantic Treaty Organization.

(b) Reports of the North Atlantic Assembly do not, in any way, represent formal decisions on the part of the Alliance.

UNILATERAL DISARMAMENT

Senator WARNER. You gained some notoriety in your recent appearance before the House Foreign Affairs Committee in which you asserted that supporters of the nuclear freeze had formally embraced a program calling for unilateral disarmament. What evidence do you have to support that contention?

Mr. PERLE. As you may recall, what I characterized specifically as "unilateral" were the decisions taken in early February in St. Louis by the leaders of the U.S. nuclear freeze movement. As reported in the New York Times, the freeze leaders stated that the freeze movement will henceforth oppose additional spending on nuclear forces by the United States. That is, they will attempt to impose a freeze on U.S. modernization while merely calling for, but not making U.S. actions contingent upon, similar Soviets restraint. This I believe is fair to characterize as "unilateral".

While the House freeze resolutions use the words "mutual and verifiable", I should point out that the practical effects of an immediate freeze would be close to unilateral disarmament. A freeze now would codify existing Soviet military advantages while preventing the United States from undertaking long overdue modernization to replace our aging and increasing vulnerable deterrent forces. At the present time, Soviet nuclear forces are substantially newer, more powerful and more survivable than are ours. For example, 75 percent of Soviet nuclear warheads are on launchers the average age of which is five years or younger, while the same percentage of U.S. warheads are on launchers the average age of which is fifteen years or older.

Thus, even without cheating, the Soviets can easily maintain their sizable military advantage under a freeze. In contract, without modernization, elements of the U.S. strategic Triad will, over time, become obsolete—that is, our deterrent capability will slowly wither away.

Questions Submitted by Senator Sam Nunn

NUCLEAR WAR AT SEA

Senator Nunn. Secretary Perle, last year, during this hearing, you and I had a discussion about your statements about nuclear war at sea. What is your view on this matter now? Do you still believe we have disadvantages in the strategic nuclear balance? Do you still believe we have distinct disadvantages in the theater nuclear balance? Do you still believe that a nuclear war at sea should not be confined there, but escalated to land in areas where we have disadvantages?

Mr. Perle. With regard to the strategic nuclear balance, Senator Nunn, I believe it is clear that the Soviet Union has distinct advantages in most significant measures of strategic forces. One area in which we still retain some advantage in total numbers of deliverable weapons, but that advantage rests chiefly on an aging bomber fleet whose ability to penetrate Soviet air defense is increasingly in question. In any event the continuing growth in the number of Soviet warheads means that even that small U.S. advantage may soon disappear.

At the time of the SALT I Agreement some 10 years ago it was generally accepted that rough parity existed between the two sides. When one examines what the Soviets have done since that period and compares it with actions the United States has taken, there can be little question that the strategic nuclear balance has been adversely affected.

Similarly, during a decade in which our nuclear force posture in Europe has not undergone significant changes, the Soviets have undertaken large forward deployments of new and highly capable nuclear delivery means. In addition to the deployment of SS–20 missiles, the Soviets have fielded modern replacements for their shorter-range missiles (SS–21 and SS–23 missiles are replacing FROG and SCUD, the SS–22 is replacing Scaleboard). Large numbers of Fencer, Flogger and Fitter aircraft have been forward deployed and the Soviets now have nuclear warheads for cannon artillery. These increases give the Soviets a capability for flexible nuclear strike options they never had before. We are definitely at a disadvantage in theater nuclear capability.

With regard to a nuclear war at sea, Senator, last year I told you that it was U.S. policy that we would not permit the Soviet Union to confine a nuclear war to the sea. That policy stands—for three important reasons. First, the essence of deterrence is that our retaliatory capability must raise incalculable risks to any potential aggressor; in this regard, we have never—confine our retaliation within the boundaries of any particular theater. Rather, to support our deterrent policy, we will continue to make clear that we have the capability to escalate a conflict, and that we will take whatever steps are necessary to halt aggression against us or our allies. Secondly, it is a fact that we and our allies are far more dependent on using the sea than are our potential adversaries. If we agree to confine a nuclear war to the sea—by, for example, tacitly agreeing to a series of tit-for-tat exchanges—we would soon lose the surface naval capabilities we depend on to defeat the naval air, surface and submarine forces attempting to sever our SLOCs. Thus a nuclear war confined to the sea, even if it resulted in the essential elimination of both the U.S. and Soviet surface fleets would threaten our ability to reinforce our allies. Finally, land-based air, especially the SNA Backfire, is an important element of the Soviet naval nuclear threat to our Navy. Agreeing to confine a nuclear war to the sea would in essence allow the Soviets to operate nuclear strikes against our naval forces from a sanctuary of land-based airfields, and this would undercut both deterrence and defense. Based on all of this, we remain convinced that our policy is a prudent one which decreases the risk of war by increasing our ability to affect the Soviet risk calculus, and thus reinforce our capability to deter.

"TWO FOR ONE" BUILD DOWN

Senator Nunn. Secretary Perle, Senator Cohen and I have proposed a guaranteed nuclear build-down concept or "two for one" reduction proposal. Could you provide for the record your office's views of this proposal as it relates to both strategic and theater systems and to the current U.S. arms control positions in START and INF?

Would such a concept provide a vehicle for reducing to the levels outlined in the U.S. proposals? What problems, if any, do you have with this proposal in terms of U.S. force modernization goals? Could you comment on Senator Percy's description of how this proposal and concept could be implemented?

Mr. PERLE. As we have said previously, this administration shares the goals and endorses the spirit of your proposal, to seek, within the context of negotiated arms control agreements, a build-down of nuclear weapons, while allowing the modernization and replacement of nuclear forces necessary to correct the strategic balance, and maintain a stable deterrent. We seek a stable balance at the lowest level of military forces. Whenever modernization permits us to maintain the balance at lower levels, we can reduce forces and have done so in the past. Likewise, whenever the threat is reduced, whether by arms control or by unilateral actions on the other side, we can make reductions.

In the START and INF negotiations, we are seeking agreement on deep, verifiable reductions to equal and stabilize force levels. Because Soviet and American nuclear force structures differ significantly, it is not easy to apply a single mechanism for reductions in the forces of both sides and still maintain stability.

As with all arms control proposals based on fairly rigid mechanisms for technical implementation, the Cohen-Nunn proposal would contribute to stability and deterrence only if some flexibility were permitted in the application. In our case, the reason for this is obvious—U.S. weapons systems are, on average, older than comparable Soviet systems. For example, about three-fourths of U.S. warheads are on launchers or delivery systems which are 15 years old or older. In sharp contrast, three-fourths of Soviet warheads are on systems 5 years old or less. The Soviet Union has just completed a major modernization of its forces and, while it continues a dynamic military program, it does not face the survivability and aging problems that confront our strategic forces. We absolutely must modernize; the Soviet Union need not. Our land based missiles are old and vulnerable; theirs are new and secure. With the exception of two Trident submarines, all of our submarines were built in a few years in the early to mid-1960s. Since then the Soviet Union has deployed over 60 new ballistic missile submarines of five new types. Since we are heavily dependent upon our strategic bomber force for our deterrent, we also must modernize this leg of our strategic Triad. For example, we must bring the B–1 bomber into the force and extend the life of our quarter-century old B–52s by adding air launched cruise missiles. The Soviet Union, less dependent on its bombers and possessing a large, new Backfire bomber force, has no comparable requirement for modernization. Furthermore, our bombers face formidable air defenses that would not be limited by the mutual build-down. In short, given the fact that our modernization requirements are different, and also given the difficulties in verifying the actual numbers of weapons which are really added to delivery systems (as opposed to counting rules), a rigid application of the build-down principle could be destabilizing because it would be one-sided.

The key to enhancing stability via any arms reduction proposal is in providing the flexibility to address the very real problems resulting from differences in the forces on both sides. Senator Percy's approach to a mutual build-down illustrates how one could approach some of the problems of the build-down. However one were to approach a mutual build-down, stability would best be promoted by having provisions which prevent the emergence of destabilizing inequalities. And finally, effective verification would be absolutely essential.

DOD AUTHORIZATION/TECHNOLOGY TRANSFER

Senator NUNN. Secretary Perle, what legislative initiative could be taken in the fiscal year 1984 DOD authorization bill to deal with the problems of technology transfer that you have testified about and done so much meaningful work?

Is there a set of both short-term and long-term measures we could initiate in this area?

Mr. PERLE. We have made progress in the technology transfer area and we will soon be able to close the gap between desires and performance, provided of course we retain the excellent help of the Armed Services Committee. As I am sure you are aware, the Defense Authorization Act—fiscal year 1983, reflected the concern of Congress that, ". . . DOD's technology transfer programs lack adequate resources, permanently assigned personnel, and sustained, highlevel policy supervision" (SASC Report on DOD Authorization Act, fiscal year 1983, No. 97–330, Pg. 151). Additionally, it provided $2 million for operating funds and required the Secretary of Defense to submit a written report each fiscal year recommending resources necessary for this program (DOD Authorization Act, fiscal year 1983, Conference Report No. 97–749, Pg 170). In response, Defense

added 34 permanent personnel to the Policy area and 10 to Research and Engineering. Incidentally, we are in the process of filling these positions now. Also, we established a Program Element for technology transfer control with the $2 million as a new start program. The other DOD components (USDR&E, Army, Navy, Air Force, DIA, and NSA) are establishing technology transfer Program Elements for fiscal year 1984.

Our initial manpower studies first concentrated on OSD agencies then on all DOD Components that deal with technology transfer. Our first report to Congress on the DOD Technology Transfer Program outlined our fiscal year 1984 budget submission. As I am sure you can appreciate, the fiscal year 1984 budget was simply a best guess regarding technology transfer and our first attempt to establish a base line for the program. Since that budget submission we have gained experience and understanding of what more accurately reflects the true minimum needs of our program. On the attached resource summary I believe I have described the minimum resources required to make our DOD program whole. Please notice that the "add on" is in addition to the fiscal year 1984 budget submission. The authorization of the fiscal year 1984 budget request plus the "add on" would be the kind of legislative support which we need to get the job done. We need the SASC to identify this request as a "minimum base line" for our program. This will serve to protect the program for the long term and prevent others in the future from selectively weakening the effort.

DOD TECHNOLOGY TRANSFER CONTROL PROGRAM RESOURCE REQUIREMENTS

[Dollar amounts in millions]

Component	1983 fiscal year		1984 fiscal year		Initiatives 1984 fiscal year		Enhanced 1984 fiscal year	
	Amount	Personnel	Amount	Personnel	Amount	Personnel	Amount	Personnel
OUSD P	$2.822	46	$3.127	46	$0.249	10	$3.376	56
OUSD R&E	3.067	22	4.035	22	.675	20	4.710	42
Navy	2.250	37	2.250	37	.000	6	2.250	43
Air Force [1]	.182	5	.182	5	.000	0	.182	5
Army	2.000	47	2.000	47	1.000	16	3.000	53
Subtotal	10.321	157	11.590	157	1.924	52	13.518	209
General defense intelligence program:								
DIA	[Deleted]							
Army								
Navy								
Air Force								
NSA								
Total								

[1] These figures constitute the AF technology transfer control program established as directed under 2 new program elements (PE's). These personnel were previously fulfilling the same functions under different PE's. The program will be ungraded beginning in fiscal year 1985. Other activities within AF in fiscal year 1983 include 32 persons who are engaged at least 50 percent of the time in technology transfer. Their total funding is estimated to cost $1,900,000.

NUCLEAR WEAPON CONSTRUCTION

Senator NUNN. Dr. Wagner, what are the changes in nuclear weapon construction in recent years that makes these systems safer than old warheads?

Dr. WAGNER. Senator Nunn, as you know, there has been a growing concern in some segments of the public, for safety issues, almost demanding a risk-free world. While some of us believe these demands are excessive, the concerns are real and must be taken into account when we consider the public views of the trust put in us in our stewardship of nuclear weapons. Our nuclear weapons have always been designed with a high level of safety built in, and the record of the last 38 years has been excellent. There has never, in response to the heightened sensitivity, today's nuclear weapons are designed and built to even more stringent safety standards than was the case even a few years ago.

One area of recent improvement is in the generation of unique firing signals. The electrical systems and strong link/weak link pairs in our modern warheads provide nuclear detonation fail-safe protection beyond that thought achievable in the 1960s. This accomplishment was the product of a vigorous effort to develop

system concepts and components that would respond in a predictably safe manner even in severe accident environments such as fire or crashes.

Another area of recent improvement is the type of high explosive used in our modern weapons. The possibility of scattering radioactive material in potential accidents involving nuclear weapons has been greatly decreased by use of insensitive high explosive (IHE) rather than conventional explosives used in older weapons. Developing an IHE suitable for use in nuclear weapons required more than ten years of dedicated research and development. IHE is now generally used in all warheads and being produced or in engineering development, unless clear operational penalties preclude it.

Questions Submitted by Senator Strom Thurmond

NUCLEAR FREEZE AND STABILITY OF NATO

Senator Thurmond. Mr. Perle, if the United States and the Soviet Union were to enter into a nuclear freeze, what would be the impact on the stability of NATO:

Mr. Perle. The impact on the cohesion of NATO, American leadership, and spirit of bipartisan diplomacy would be extremely serious. First, an American negotiation of an immediate freeze would unilaterally repudiate the NATO Alliance-wide 1979 dual-track decision to deploy Pershing II and GLCMs to counterbalance Soviet SS–20s and to seek U.S.-Soviet arms reductions providing equal ceilings and equal rights. NATO leaders oppose a freeze for precisely these reasons. Second, a freeze today would increase fear in Europe that NATO would be "decoupled" from the American nuclear umbrella, a fear which led European leaders to press for the dual-track decision in the first place.

NUCLEAR FREEZE AND NEGOTIATIONS

Senator Thurmond. Mr. Perle, last year you read the committee a quote from Sir Samuel Hoare about the disastrous way negotiators are pressured into reaching an agreement just for agreement's sake. I agree with Sir Samuel except that only negotiators from democratic countries are subject to such pressures. Negotiators from totalitarian regimes are independent from public opinion.

Do movements such as the nuclear freeze campaign have such an impact on our negotiators today?

Mr. Perle. As Ambassador Rowny wrote in a letter to Congressman Broomfield last June 25, passage of a nuclear freeze resolution "would make my job as a negotiator much more difficult". The reasons for this are two-fold. First, a U.S. nuclear freeze vote would signal to the Soviets that Americans were neither serious, nor united, on the vital issues of American strength and American determination to negotiate far-reaching, equitable and verifiable reductions in nuclear forces such as we have proposed at the START and INF talks. Second, by permanently codifying existing Soviet advantages and preventing the U.S. from carrying out our long overdue modernization program, a freeze would undercut any Soviet incentives to negotiate seriously on reductions. In short, a freeze would replace reductions, and virtually eliminate the likelihood that they would ever occur.

[Whereupon, at 1:33 p.m., the subcommittee adjourned, subject to the call of the Chair.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1984

FRIDAY, MARCH 18, 1983

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC AND
THEATER NUCLEAR FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

STRATEGIC COMMAND, CONTROL AND COMMUNICATIONS

The subcommittee met in open session pursuant to recess at 2:08 p.m., in room SR-222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Present: Senators Warner, Wilson, and Exon.

Staff present: Frank J. Gaffney, Jr., George K. Johnson, Jr., and Patrick L. Renehan, professional staff members; Karen A. Love, staff assistant.

Also present: John Campbell, assistant to Senator Warner; Greg Pallas, assistant to Senator Exon, and Ed McGaffigan, assistant to Senator Bingaman.

OPENING STATEMENT BY SENATOR JOHN W. WARNER, CHAIRMAN

Senator WARNER. The subcommittee will now commence our afternoon session. We had a very extensive and profitable closed session this morning with the commander of the strategic Air Command, General Davis.

This afternoon we will begin consideration of what has become, in recent years, one of the most important and broadly supported aspects of the President's strategic force modernization program. As our witnesses well know, this committee 2 years ago, took steps at its own initiative, to provide for important improvements to the Nation's C^3 network.

Since that time, we have followed with interest developments in the administration's thinking about and funding for enhancements of this vital central nervous system of our strategic deterrent. We look forward to receiving an update on this subject from the distinguished individuals appearing before us today.

Mr. Don Latham, Deputy Under Secretary of Defense, Communications, Command, Control and Intelligence, has been a driving force behind these long overdue system upgrades.

Similarly, the Joint Strategic Connectivity Staff, today represented by Rear Adm. Paul Tomb, has provided much of the supporting analysis and program options.

We look forward to hearing from these gentlemen on how the initiatives funded thus far have improved our strategic connectivity posture and what remains to be done.

In addition, we are pleased to have Vice Adm. Gordon Nagler, Director, Command and Control and Maj. Gen. Bernard Randolph, Director, Space Systems and Command, Control, Communications, representing the two services directly involved in the strategic mission.

We will proceed briefly here in open session. A vote is anticipated in about 20 minutes or so and that may well be the appropriate time to go into closed session.

Does the gentleman from California have any opening observations?

Senator WILSON. No, sir, Mr. Chairman.

STATEMENT OF DONALD C. LATHAM, DEPUTY UNDER SECRETARY OF DEFENSE (COMMUNICATIONS, COMMAND, CONTROL, AND INTELLIGENCE)

Mr. LATHAM. Thank you very much for having us here this afternoon. Indeed we will attempt to summarize for you the progress we have made during this last fiscal year and what we intend to do with the fiscal 1984 funds that we have requested.

Specifically for fiscal year 1984 the total communications, command and control budget to the President is $16.7 billion which is up approximately 18 percent from the fiscal 1983 request, and of that $16-odd billion, about $4.6 billion is the strategic C^3 area, up approximately $1 billion from the fiscal 1983 request in this area.

We will summarize for you in the closed session in more detail the specific progress we have made and the details of what the 1984 moneys will bring in the areas of communications, command, and decision initiatives and tactical warning and in the attack assessment area.

[The prepared statement of Mr. Latham follows:]

PREPARED STATEMENT OF DONALD C. LATHAM, DEPUTY UNDER SECRETARY OF DEFENSE (COMMUNICATIONS, COMMAND, CONTROL AND INTELLIGENCE)

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE: It is my privilege to appear before you today to discuss the Strategic Communications, Command and Control (C^3) elements of the President's program for revitalizing our strategic deterrent posture. It is our firm belief that a credible, reliable and survivable C^3 system offers the greatest deterrent to any possible future war. Accordingly, our present budget request emphasizes improved reliability and survivability of existing systems and the initiation of programs that will improve surveillance and warning capabilities for both the air-breathing and ballistic missile threats. In addition, we will be initiating the acquisition of systems that will help sustain essential C^3 functions during all phases of conflict. It is vital that we proceed with our major strategic C^3 program to assure that the National Command Authority (NCA) is continually linked to our surveillance and warning systems, our command centers and our nuclear capable forces. It will be because of this assured NCA-to-Forces Connectivity that any adversary must consider an attack on the United States as a very high risk option. Our budget request for strategic

C^3 programs is fiscal year 1974 is $4.6 billion. That is a large sum, and I am here to explain why these funds and your support are so essential. Before detailing our needs, I will provide a brief overview of C^3 mission objectives.

I. OVERALL OBJECTIVE OF THE C^3 MISSION

Our C^3 system must provide the means to transform individual combat units into an integrated, effective force. This system must satisfy the needs of all echelons of our forces to observe, provide warning and assess adversary intentions, collect and process information on the status of our own and hostile forces, support decision-making, and communicate commanders' decisions to the forces. Essential supporting functions include navigation and position-fixing to establish a common geographical frame of reference for intelligence systems and the forces and information systems to support operational planning of missions.

II. STRATEGIC C^3 MISSION AREA

Since I reported to you last year, we have had some rearrangements in our mission areas. Satellite Communications, which was previously part of Defense-Wide Systems, is now a part of the strategic C^3 mission area. Strategic C^3 requirements determine many essential features needed for satellite communications and this change facilitates better integration of our programs. This change accounts for the major portion of the increase funding request for tihs mission area in fiscal year 1984.

The difficulty of the C^3 mission is intensified by the fact that our basic national security policy is one of deterrence, which requires that we sustain a capability to react quickly and effectively after the enemy has taken the first initiative. We have taken several important steps to improve our ability to develop, procure, manage and operate our C^3 system. These include the following:

We are giving our C^3 systems equal priority with the weapon systems they support, and treating the C^3 weapon-system mix as a unified element. This perspective will help ensure that the needs of the Force Commanders for force management and force capabilities are balanced over a broad range of possible conflict environments.

We are pursuing a planning process which views the evolving C^3 weapon-system mix over a 15-year horizon to guide the direction and pace of that evolution. By adopting this perspective we hope to improve program stability and create a better integrated system.

We are designing and deploying an enhanced C^3 system which, through emphasis on survivability and endurance, can resist the current and projected threat.

Our strategic C^3 program addresses three primary areas: surveillance and warning, command centers and communications connectivity. The modernization initiatives contained in this program is considered the highest priority segment of the President's strategic modernization program.

A. Surveillance and warning

In the surveillance and warning area we subdivide programs into those directed toward the atmospheric threat and those associated with the ballistic missile threat. With regard to the missile area, we are continuing with the acquisition of the ground-based PAVE PAWS radars to eliminate gaps in our present SLBM coverage in the southeast and southwest areas. The southeast radar will have greater target detection capability than other PAVE PAWS radars, permitting it to perform a secondary satellite tracking mission. This will permit us to shut down the aging FPS–85 radar in Florida, which provides essential space-track data. We expect to complete the BMEWS missile impact prediction computer replacements at all sites and to continue the Thule radar modernization. These steps will improve our attack assessment capabilities.

Two new early warning satellites will be acquired with fiscal year 1984 funds to maintain the existing space segment for ballistic missile launch detection. These new satellites will be of a modified design in order to improve system survivability relative to the existing space segment. We will continue to acquire mobile ground terminals (MGT's) that will provide an austere back-up capable of processing the satellite data and provide direct readout of warning information to the users. These MGT's are virtually impossible for the Soviets to target and that frees us from dependence on the very vulnerable fixed ground processing facility used today.

We will also be acquiring sensors for deployment on NAVSTAR Global Positioning System satelites to accurately locate and characterize nuclear detonations in near real time on a worldwide basis. This system known as the Integrated Operational NUDETS Detection System (IONDS), will permit assessing damage we have sustained and the effects of our retaliatory strikes.

In the area of atmospheric threat warning, we are initiating the acquisition of new long range radars (LRR's) for the DEW Line and we expect to complete the R&D for new short range radars (SRR's). The LRR's will require minimal manning and no manning will be required for the SRR's. As a result of this reduced manning and improved reliability, we plan to deploy 19 more radar systems than are in operation today while cutting our operations and maintenance costs to about half of our fiscal year 1982 cost. This deployment will provide contiguous surveillance coverage of the northern attack routes and with the new Over-the Horizon Backscatter (OTH–B) systems being deployed in the Southern Area as well as in the East and West Coast areas, the U.S. will have a complete contiguous all-altitude surveillance coverage of all approaches to North America. The fiscal year 1984 OTH–B request provides for continuing the upgrade of the 60-degree experimental radar system located in Maine to its operational configuration, in addition to acquiring two additional 60-degree sectors for that same location to provide full East Coast coverage. These improvements are also an integral element of the President's strategic modernization program.

B. Command centers

In this area, we are upgrading the survivability and capability of command centers that would direct U.S. strategic forces during a nuclear war. This includes the continued deployment and upgrading of our E–4B airborne command posts to serve the National Command Authority in time of war. EC–135 airborne command posts serving military commanders will be hardened against nuclear effects and will be equipped with upgraded satellite and very low frequency/low frequency communications equipments. These communications upgrades will help sustain connectivity in the event of severe jamming.

C. Communications connectivity

Our strategic communications programs are structured to provide improved communication connectivity between command locations (including NCA), sensor sites and nuclear capable forces. New acquisitions will emphasize survivability and endurability. In fiscal year 1984, we will continue with the Defense Satellite Communications System (DSCS) III program by procuring long lead items for four new DSCS III satellites. These new satellites will provide increased capacity, improved jamming protection and a high degree of autonomy which means that they will be less dependent on the single satellite control facility (SCF) located at Sunnyvale, California. We will also initiate full scale engineering development of the MILSTAR space segment with a projected first launch later in this decade. This program will provide a highly enduring satellite space segment for two-way connectivity to the forces. Operating in the Extremely High Frequency (EHF) band MILSTAR will provide improved AJ protection and be more capable of effectively operating in a nuclear environment. While we are still doing development work with some EHF terminals, we will initiate the acquisition of the EHF single channel objective tactical terminal (SCOTT) in fiscal year 1984. We are continuing with the Fleet Satellite Communications (FLTSATCOM) satellite acquisition; in fiscal year 1984, we will procure FLTSATCOM No. 7 which will have an EHF package on board in addition to the normal Ultra High Frequency (UHF) capability, as an interim measure until MILSTAR service is available. And finally, in the satellite area, we will be provided UHF leased service via LEASAT. This program has been delayed because of delays in the space transportation system program. We are now expecting a first satellite launch in May of 1984.

In areas other than satellite communications, we are initiating acquisition of modem HF equipment for our Theater Nuclear Forces that will provide communications connectivity in both a jamming and a nuclear environment. In CONUS, we will complete the second phase of the Ground Wave Emergency Network (GWEN). This system will operate at low frequency and provide essential connectivity to major command locations, sensor sites, strategic bomber bases and missile launch control centers. The system will ultimately

have somewhere between 300 to 500 relay nodes to assure an austere communications backbone even after a nuclear laydown. The fact that this system will maintain communications connectivity even after a nuclear attack will discourage attacks on terrestrial communications links.

III. CONCLUSION

A comprehensive and integrated strategic C³ program is an absolute necessity to implement any plan for revitalizing our strategic deterrent regardless of the composition and quality of our strategic forces.

We must be able to accurately sense and estimate the specific objectives of an attack; communicate with our forces prior to, during, and after an attack; and retain the ability to direct our strategic forces in a counter-thrust, the strength of which will be so unacceptably high to the Soviets, they will be deterred from ever initiating an attack.

Our program takes a major step toward providing such a credible strategic C³ posture. We will support this step with a technology R&D base for continued improvement and as a basis for determining what additional steps may be needed. Particular emphasis will be placed on assuming means for reconstitution and recovery after an attack.

Mr. Chairman, this concludes my remarks. I urge your support of the strategic C³ program, and will be happy to answer any questions you or the committee might have.

Mr. LATHAM. I would like to turn the microphone over to General Randolph to summarize his area.

STATEMENT OF MAJ. GEN. BERNARD P. RANDOLPH, U.S. AIR FORCE, DIRECTOR, SPACE SYSTEMS AND COMMAND, CONTROL, COMMUNICATIONS, DEPUTY CHIEF OF STAFF, RESEARCH, DEVELOPMENT, AND ACQUISITION, HEADQUARTERS USAF

General RANDOLPH. Thank you, Mr. Chairman.

I have a formal statement to enter into the record. With your permission, I would like to summarize that in unclassified fashion.

In presenting my summary I would like to point out some of the things we have accomplished with the support of this committee in the past years and also the kinds of things we expect to do in fiscal 1984.

I would like to point out the fact that last October we successfully launched a mission that was a number of firsts, the first Titan 34D, the first inertial upper stage [IUS], and first DSCS III spacecraft all in one mission. It was a success.

That DSCS III program had early program growth. I am pleased to report that has been brought under control. The first DSCS III satellite is performing above our expectations. We have signed fixed-price contracts for the first four production spacecraft at slightly less than we previously advised the Congress.

In addition, we propose in fiscal year 1984 to go ahead with long-lead parts for four additional spacecraft.

With regard to SACDIN, we have successfully completed the hardware validation phase and begun field testing with installations at Offutt Air Force Base in Omaha and Vandenberg Air Force Base in California.

SACDIN provides reliable and secure data communications and record data systems as required to support the needs of the NCA and CINCSAC. We will complete the test program and go into production in fiscal year 1984.

We began moving out smartly on the new communications satellite MILSTAR with release of the full-scale engineering development request for proposals. You will recall MILSTAR is designed to be highly survivable for all levels of conflict and is the centerpiece of the President's strategic C^3 modernization program.

By the way, we just selected Lockheed as the prime contractor to develop the space segment and expect to award a contract this spring and complete specific design work in 1984.

We let a contract for the over the horizon backscatter [OTH–B] radar system in Maine to improve that to a fully operational configuration and to ultimately deploy it on the east coast of the United States and, of course, we plan an installation on the west coast.

In fiscal 1984 we will complete the first 60 degree sector which is in Maine and begin work on the two other 60 degree sectors to complete east coast activity. This radar will give us long-range surveillance out to 1,800 miles from each of the coasts.

The Air Force accepted the first regional operations control center [ROCC] at Tyndall Air Force Base, Fla., this past year and this ROCC is part of our overall new joint surveillance system which provides the surveillance and command and control functions required for peacetime air sovereignty and air defense in crisis or wartime.

Interestingly enough our manpower requirements will be reduced by 5,000 slots when we complete this improvement and, more importantly, our annual O&M costs will be reduced by $100 million.

We have awarded a contract for the initial connectivity capability of the nine-relay nodes which are part of the ground wave emergency network [GWEN].

As you also may recall, the ground wave emergency network program provides a high confidence communication link between our sensors, the NORAD sensors, the CONUS based SIOP forces and the national command authority [NCA]. GWEN gives us a system protected in a nuclear environment unlike anything we have today.

In fiscal 1984 we will begin full-scale development of GWEN leading to a 45-node operational capability by fiscal 1985. So we have been able to move rapidly in this area.

We began the diversity reception equipment program which provides improved VLF receiving equipment for all Air Force ground and airborne systems.

We are pleased by the fact that we were able to let this contract to a small business which we feel will be able to perform. In fiscal 1984 we will continue design work leading to a completed design in this area.

We continue working on providing the vital command, control and communications to effectively integrate, coordinate and manage all of our space defense resources. The Space Defense Command and Control System [SPADOC] is the centerpiece of this effort. It is a phased approach to the upgrading and integration of our sensors providing information to protect our spacecraft; the defensive kinds of things that we are doing to protect our space systems and supporting our antisatellite work. We plan to complete design work in fiscal 1984 to include extensive software.

The current atmospheric defense system of North America which includes United States and Canada in a cooperative venture and is composed of ground-based radars as part of the distant early warning [DEW] line, the continental air defense integration north called CADIN/PINE TREE system in southern Canada, plus the joint surveillance system.

However, all these radars have limited range, significant gaps in low altitude coverage and high O&M costs.

We have a comprehensive upgrade program which includes replacing the existing DEW with a series of minimally attended radars and unattended long-range radars which will reduce our overall O&M cost by a significant amount.

In addition, we will be able to terminate our involvement in the CADIN/PINE TREE as a result of the improve new radars, thus further reducing our O&M. This combined reduction in O&M will allow our initial replacement investment to be amortized in a little more than 3 years.

The Congress will soon receive a fiscal year 1983 reprograming request for $8 million to begin this program. The reprograming is necessary to keep it on schedule in accordance with the congressional direction which we received as part of the fiscal year 1983 appropriations bill.

In fiscal year 1984 we propose to procure 11 of these long-range radars, FPS–117, and begin developing the new short-range gap filler radars.

Sir, this concludes a brief overview of the kinds of things we are doing and some of the things we propose in fiscal 1984.

[The prepared statement of General Randolph follows:]

PREPARED STATEMENT OF MAJ. GEN. BERNARD P. RANDOLPH, DIRECTOR SPACE SYSTEMS AND C^3, RESEARCH, DEVELOPMENT AND ACQUISITION HEADQUARTERS, USAF

I. INTRODUCTION

MR. CHAIRMAN AND MEMBERS OF THE COMMITTEE: It is a pleasure to talk to you today on the Air Force Command, Control and Communications program request for fiscal year 1984. The budget request you have before you represents a C^3 program which continues to strengthen those initiatives begun in response to President Reagan's top priority on upgrading our C^3 posture. I am here to assure you we are making every effort to insure our C^3 systems can survive and operate in a hostile war time environment.

With your permission, I want to highlight some accomplishments in the Air Force C^3 program during this past year:

We successfully launched a mission last October that was remarkable for a number of firsts. We launched our first Titan 34D, our first IUS and first DSCS III, in one mission.

The DSCS III program had experienced some early cost growth. That program has been brought in at the budgeted cost and the first satellite is performing above our expectations. We have signed fixed price contracts for the first four production spacecraft at slightly less than our earlier projections.

We successfully completed SACDIN hardware validation and began field testing with installations at Offutt AFB, NB and Vandenberg AFB, CA. As you know SACDIN provides a reliable and secure digital data communications and record data system as required to support the needs of the NCA and CINCSAC.

We began moving out smartly on our major new communications satellite program, MILSTAR, with the release of the FSED contract. This system is designed to be highly survivable for all levels of conflict and is the center piece of the President's Strategic C^3 modernization program.

We let the contract to upgrade our experimental OTH–B radar system to a fully operational configuration and to ultimately deploy it as the first sector of the East Coast operational radar system (3 sectors total). This radar will provide a long range surveillance capability, out to 1800nmi., not possible with currently deployed air-defense radars.

The Air Force accepted the first Regional Operations Control Center (ROCC) at Tyndall AFB, Florida. This ROCC is part of our overall new Joint Surveillance System which provides the surveillance and Command and Control functions required for peacetime air sovereignty and air defense in crisis or wartime for as long as it survives. It will reduce manpower requirements by 5000 slots and more importantly reduce O&M costs by $100M annually.

We awarded a contract for the Initial Connectivity Capability (ICC) which is simply a proof of concept program for the Ground Wave Emergency Network (GWEN). The GWEN program will provide a high confidence communication link between our sensors, NORAD, the CONUS based SIOP forces and the National Command Authority. GWEN gives us a system protected in a nuclear environment unlike today's systems.

We began the Divercity Reception Equipment (DRE) program which provides improved VLF receiving equipment for all Air Force ground and airborne systems. We were very pleased to let a large contract on this program to a small disadvantaged business.

We continue working on providing the necessary vital command, control and communications to effectively integrate, coordinate and manage all space defense resources. The Space Defense Command and Control System (SPADOC) is a phased approach to support the integration of our sensors (monitor and inform), the defensive posture of our own space systems (protect), and our antisatellite system (negate).

The current atmospheric defense system of North America, a United States-Canadian, co-operative venture, is composed of ground-based radars in the Distant Early Warning (DEW) Line, the Continental Air Defense Integration North (CADIN)/Pinetree system in southern Canada, and the Joint Surveillance System. However, these radars have limited range, significant gaps in low altitude coverage and high O&M costs (mostly because of age and obsolesence of the equipment). We have a comprehensive upgrade program which includes replacing the existing DEW line with a series of minimally attended long range radars and unattended short range radars which will reduce the O&M costs nearly 50 percent. Further, the initial investment for this replacement program will be amortized in little over three years. The Congress will soon have before it a reprogramming action in fiscal year 1983 for $8M dollars to begin this program and keep it on schedule, in accordance with congressional directions as part of its fiscal year 1983 appropriations bill.

I have provided, here in my formal testimony, detailed information on the Air Force C^3 programs which, with your permission Mr. Chairman, I will insert for the record along with my spoken testimony. Thank you for your time and we look forward to your continued support in helping to make the U.S. C^3 program stronger than ever.

II. COMMAND, CONTROL, AND COMMUNICATIONS (C^3)

C^3 systems link together all of our national defense assets. C^3 systems are essential to implement strategy, control forces, and employ weapons in modern warfare. These systems support day-to-day operations, provide time-critical warning information to decision makers, facilitate accurate situation monitoring and allocation of resources in crisis situations, and permit the appropriate and effective employment of military power in wartime.

Recognizing the importance of C^3 in directing military operations, the Soviets are placing heavy emphasis in their doctrine on the disruption of our C^3. The threats to our systems include both physical and electronic attacks.

In response to this growing threat, our primary objective is to increase the survivability, security, and jam resistance of our C^3 links. Another objective is to improve both the reliability and interoperability of our systems. Finally, we want to exploit new technologies to more effectively meet future C^3 requirements and overcome future threats to our system. The discussion in this chapter will focus on our strategic, tactical and defense-wide C^3 modernization programs.

Strategic C³

Our Strategic C³ programs include warning and assessment systems, command centers, and supporting communications systems. Since the warning and assessment systems were discussed in the Strategic Defene section, this section will concentrate on command centers and communications.

One of the key features of the President's strategic program is the modernization of strategic C³. For deterrence to be a successful policy, we need effective strategic C³ systems which will be able to support the wartime planning and employment of our nuclear forces. In the past, we have not modernized our C³ systems fast enough. As a result, these systems have insufficient survivability and reliability to operate dependably during a nuclear conflict. Consequently, we are increasing the survivability and endurance of our strategic C³ systems. Our objective is to make these systems as strong as the forces they support.

One of the primary programs for enhancing command and control of our strategic forces is the Air Force Satellite Communications (AFSATCOM) System. The AFSATCOM system consists of aircraft terminals, ground terminals, and communications packages on several satellites, including the Fleet Satellite Communications (FLTSATCOM) System, and the Satellite Data System (SDS) satellites, along with classified host spacecraft. In our AFSATCOM RDT&E program, we are developing improvements to our existing ultra high frequency (UHF) AFSATCOM terminals which will allow us to better withstand enemy jamming efforts and provide a smoother transition to MILSTAR—the next generation satellite system.

We are currently installing AFSATCOM terminals in strategic bombers, reconnaissance and surveillance aircraft, ground and airborne command centers, and missile launch control facilities. The installation of these terminals will be virtually completed by December 1983. In addition, the Army and Navy are also acquiring terminals for their own systems. Our fiscal year 1984 request includes procurement funds for an AFSATCOM communications package to be integrated on a host spacecraft to ensure continuity of communications in critical geographic areas.

In fiscal year 1984, we will continue to develop the new satellite communications system called MILSTAR to replace AFSATCOM. MILSTAR will fulfill the urgent need for highly jam-resistant and survivable satellite communications, and will feature increased jam resistance by using extremely high frequency (EHF) communications and increased survivability through a variety of techniques. It is a joint Army/Navy/Air Force program which will support both strategic and tactical users.

SDS provides one of the major host satellites supporting the AFSATCOM system. It provides critical two-way transpolar command and control communications for our nuclear capable forces. SDS also supports a data communications network among remote tracking stations and the STC for command and control of our satellites. Our fiscal year 1984 RDT&E program will complete the development of a Shuttle-compatible SDS spacecraft, and our procurement program is designed to sustain our capability to launch satellites to replenish the SDS orbital constellation.

The E–4 and EC–135 aircraft are survivable extensions of the fixed command centers which provide higher confidence in our ability to manage our strategic forces during a nuclear war. In fiscal year 1984 we are continuing development of several major improvements in our Airborne Command Post equipment. These include increased capabilities for the E–4B super high frequency (SHF) and EC–135 UHF satellite communications terminals, as well as continuing our work on improving the Minimum Essential Emergency Communication Network (MEECN) low frequency and very low frequency (LF/VLF) system. Development also continues on the improved communications processing, electromagnetic pulse (EMP) testing, and terminals for the Integrated Operational NUDET Detection System (IONDS). These systems are being developed so that we will be able to maintain connectivity and communications in the high threat environment of the future. We are designing these systems to have, among other features, antijam capabilities so that they will be able to support operations in a nuclear environment over extended ranges for prolonged periods of time. Our fiscal year 1984 aircraft modernization portion of the C³ improvement program includes procurement funds for installing upgraded automatic data processing equipment

which will improve the E-4B battle staff's ability to provide critical and time sensitive information to the NCA. Procurement funds have also been requested to harden selected systems on the EC-135 against nuclear effects, to provide a satellite secure voice conferencing capability, and to add new Communications Security (COMSEC) units on the E-4B to support the NCA connectivity.

Another major program to improve the reliability and endurance or our strategic communications is the Groundwave Emergency Network (GWEN). The GWEN system will be a grid of unmanned, EMP hardened relay nodes operating in the LF band. This effort is a part of the MEECN program to improve its LF/VLF capabilities. Network terminals will be located at major command centers, warning sensor sites, and force element command posts. These terminals will have the capability to support two-way data communications in a nuclear environment. In fiscal year 1985 we will complete GWEN development activities and planning will begin for the final operational capability.

Under the SAC Communications program, we are developing the SAC Digital Network (SACDIN) and Aircraft Alerting Communications EMP (AACE) upgrades. SACDIN modernizes SAC's existing C^3 data system, which is aging and has insufficient capacity. SACDIN objectives are to provide responsive, two-way, secure command and control information between SAC Headquarters and subordinate commanders. The system, in addition to providing greater survivability, will also feature increased flexibility and growth capacity. In fiscal year 1984, we will continue the SACDIN field test and IOT&E and begin production, installation and transition.

In order to provide EMP protection for emergency action communications equipments, the AACE upgrade program will provide shielded enclosures for selected equipment at SAC main operating bases in the CONUS. The screen rooms and associated interface consoles will also protect the communications equipment used to relay critical action messages from the command post to bomber crews in the alert facility or in the cockpit. AACE development will continue in fiscal year 1984 and initial site surveys and installation will begin.

Our MEECN VLF/LF Improvements project provide for improved dissemination of war orders via the secure VLF/LF system. In fiscal year 1984 we will continue the development of a VLF/LF miniature receive terminal (MRT) for bomber aircraft. The bomber receiver will provide a high confidence strategic communication link for the B-1B, B-52G, B-52H and FB-111 aircraft. In addition to these VLF/LF improvements, the MEFCN adaptive high frequency (HF) communications program will provide a modular family of radios which will improve the reliability of two-way communications in a nuclear or jamming environment. In fiscal year 1984, full scale development of the near term modifications and the modular radio family will continue.

III. STRATEGIC DEFENSE

Strategic defense is an integral part of our deterrence posture. Our strategic defense forces insure that our strategic retaliatory capability survives a Soviet first strike by providing timely, reliable, and unambiguous warning, assessment and defense. Our atmospheric warning and defense systems are required to defend against bomber and cruise missile strikes, our missile surveillance and warning systems are required to provide warning and limited assessment of missile attacks, and our space surveillance and defense systems are required to provide warning and defense against attacks on our systems in space.

Atmospheric warning and defense

Over the past 20 years, the United States has significantly reduced forces assigned to atmospheric defense. At the same time, the Soviet threat has increased in numbers and capability with the introduction and continued production of Backfire bombers and improved air-to-surface missiles. A new strategic bomber similar to but larger than our B-LB, called the Blackjack, is expected to become operational during the 1980s. Given this growing threat, atmospheric surveillance and warning are required to support intercept operations and to insure that retaliatory responses can be made. Capable atmospheric surveillance and defense are necessary to preclude U.S. vulnerability to a no-warning bomber attack and to limit the damage that would be inflicted in follow-on bomber strikes. Our current atmospheric warning and defense systems have serious deficiencies which must be corrected.

Atmospheric defense of North America is a cooperative U.S.-Canadian effort. The atmospheric surveillance and warning system is configured to control access to North American airspace during peacetime, provide tactical warning of an air attack and provide command and control for air defense. The current system is composed of ground-based radars in the Distant Early Warning (DEW) Line, the Continental Air Defense Integration North (CADIN)/Pinetree system in southern Canada, and the Joint Surveillance System. However, these radars have limited range and significant gaps in low altitude coverage. Surveillance and command and control of interceptor aircraft will transition from ground-based Regional Operational Control Centers to the E–3A Airborne Warning and Control System (AWACS) aircraft during periods of crisis. Interceptors currently assigned for atmospheric defense include F–106s, F–4s and F–15s.

Within the Department of Defense (DOD), we have developed an Air Defense Master Plan. The first major initiative is to improve our surveillance and warning system through development and deployment of Over-the-Horizon-Backscatter (OTH–B) radars and through improvements to the DEW Line.

The OTH–B radar will correct coverage deficiencies by providing wide-area, long-range, and all-altitude warning of atmospheric attack from the East, West and South. Because of performance degradations from auroral effects, the OTH–B radar is not suitable as a north-looking surveillance and warning system. Therefore, we will improve the existing DEW Line radars with a mix of minimally attended long-range radars and short-range gap-filler radars.

Missile surveillance and warning

The credibility of our national defense policy of nuclear deterrence and escalation control are critically dependent on our ability to provide unambiguous, timely, reliable, and survivable, warning and assessment of an enemy missile attack.

Our ballistic missile attack warning and assessment are currently accomplished by space surveillance systems, three Ballistic Missile Early Warning System (BMEWS) sites, the Perimeter Acquisition Radar Attack Characterization System radar, two PAVE PAWS SLBM detection and warning sites and the FPS–85 and FSS–7 SLBM radars.

One of our objectives for improving the capabilities of our current systems is to improve the BMEWS radar resolution to provide information beyond simple attack warning. We want to be able to determine the accurate magnitude and probable effect of the attack in progress so that our selected response is appropriate. To achieve better attack assessment, we are developing the capability for more precise tracking and improved data processing to provide better preimpact assessment in support of critical, time-sensitive National Command Authority (NCA) decisions. The BMEWS modernization program supports this objective, as well as providing improved reliability and supportability.

In response to the growing Soviet SLBM threat, we are working to expand our SLBM warning system by deploying two additional PAVE PAWS radars in the southeastern and southwestern United States. These deployments will expand our coverage and enable us to phase out the older, less capable FPS–85 and FSS–7 SLBM radars in Florida. We are also developing upgrades for all four PAVE PAWS radars which will provide improved warning and some attack assessment.

We are continuing to pursue technology to support development of an advanced missile surveillance system for improved long-term survivability and attack assessment. Infrared data on earth background and ballistic missile signatures are being collected and analyzed in the Missile Surveillance Technology program. This effort supports development of the required technologies and designs being conducted in the Advanced Warning System program.

In our Ballistic Missile Tactical Warning/Attack Assessment Support program, we develop and maintain the overall architecture for current and programed systems to insure that individual warning and attack assessment elements operate coherently as an integrated system and that modifications to the system are certified as operational prior to IOC declaration.

Senator WARNER. That is a good progress report, General.

General RANDOLPH. Thank you, sir.

Senator WARNER. Admiral?

STATEMENT OF VICE ADM. GORDON R. NAGLER, U.S. NAVY, DIRECTOR, COMMAND AND CONTROL OFFICE OF THE CHIEF OF NAVAL OPERATIONS

Admiral NAGLER. Mr. Chairman, I request permission to put in the record a classified statement and give you a very short unclassified overview.

Senator WARNER. When we go into classified session, at that time put your statement in the record.

Admiral NAGLER. A short unclassified statement. We think the Navy has the finest peacetime crisis management command and control in the world today, but we are lacking a good enduring C^2 capability for wartime.

As you mentioned earlier, due primarily to the initiative of this committee, we are now on track to develop an enduring capability and the last Congress approved that initiative of this committee.

We are moving out on EMP hardening in our TACAMO aircraft which this committee suggested. We are in a source selection on ECX aircraft which is a replacement for TACAMO. We expect to go to contract at the end of April, next month.

The MILSTAR, with the Air Force as the lead service, the MILSTAR satellite is also critical to the Navy and the Navy is fully participating with the Air Force out in Los Angeles. We have dovetailed the program we have on EHF with MILSTAR. The Navy is the lead service for the development of terminals for the ground, sea, and air.

As you know, the extremely low frequency communications program, commonly known as ELF, was approved by Congress, and we are moving out in that area right now, and in closed session I can go into more detail on that subject.

Finally, the concept that this committee suggested we undertake, we are now moving out in those areas and know where we are actually going.

That completes my unclassified summary.

Senator WARNER. Admiral Tomb, as I understand it, most of your testimony will be in closed session. Is that correct?

Admiral TOMB. That is true.

Senator WARNER. Do you have any statement you wish to make in open session?

Admiral TOMB. No, sir, except to tender General Davis' regrets for not being here at this time. I have tendered his classified statement to you for the record.

Senator WARNER. We had General Davis for 4 hours this morning. We were able to cover much of his area of responsibility this morning.

Let me go first to just a general question.

Mr. Latham, following all of the material that comes before us with respect to cutting the defense budget, I have seen reference to the thought that perhaps we are trying to move too far too fast with consequently heavy expenditures in this field of C^3.

As you well know, since I was the one that started the initiative 3 years ago, I disagree. I would want for the record your generalized response to that recommendation.

Mr. LATHAM. Yes, sir, I share your judgment on that. I do not think we are moving too far or too fast or asking for too many expenditures.

Senator WARNER. Go over the growth pattern of the last 3 years.

Mr. LATHAM. The dollars have increased from approximately $12 billion in 1982 to $14 billion in fiscal year 1983 and the request is almost $17 billion in 1984. So, we have actually experienced a percentage growth in the command and control area that has been substantially higher than the other parts of the defense budget; however, the priority has been recognized, as you noted earlier, by the President and Secretary of Defense, and others on down.

I might add a perspective I would like to share with you, that is, if in fact there have to be cuts in the defense budget to impact on weapons programs, then your ability to execute with the strategic forces becomes even more important, with more emphasis on C^3 to be better able to control your forces.

In contrast, if somebody asked, should we take a fair-share cut in C^3 if the rest of the defense budget is cut, I would say absolutely not.

Senator WARNER. I share your view. It does provide the insurance we need against any possible accident with respect to communications, the whole network which is apparently the central nervous system of our strategic capability. You would come down on that strongly?

Mr. LATHAM. Very much so.

Senator WARNER. Admiral, I presume you share that?

Admiral NAGLER. There is no question in my mind, Mr. Chairman, without C^3 you cannot run any forces effectively. It is not a very exciting area, it is not aircraft, ships, et cetera. So, some people do not have the tendency to look at it as I probably look at it, as critical to the entire leadership of the Navy. I know that the Chief of Naval Operations, Admiral Watkins, strongly supports what you are trying to do in this area.

BLUE-GREEN LASER SYSTEM

Senator WARNER. Now some more specific questions.

Take, for example, this blue-green laser system. Do you believe the level of funding sought in the Navy and DARPA accounts for blue-green laser communications is the maximum amount that can be utilized efficiently?

Admiral NAGLER. Yes, sir. I believe in 1984 the Navy has about $1.3 million in blue-green laser and DARPA has about $30 million. The Navy's money is in advance development, the 6.2 account. I think that is more than sufficient for blue-green, personally.

I do not look for blue-green to be operational until the midnineties, 1993 to 1995 is the timeframe I am saying for the operation of the blue-green.

Senator WARNER. Have there been any substantial technical breakthroughs since we convened a year ago?

Admiral NAGLER. No, sir, I think we increased power ability around 4 percent. We need 20 percent before it is effective. I don't believe that is a breakthrough. I am also looking at it from an affordability standpoint.

In later years will that replace anything and do a better job? At the present time I am not convinced it will, but, of course, I hesitate to figure out what is best in 1995. I think from our standpoint, knowing how

we have to watch the money, I would put the money on today's problems and solve today's problems.

To answer your question directly, I think we have more than sufficient money in blue-green today.

Senator WARNER. Secretary Latham, would you care to amplify?

Mr. LATHAM. Yes, sir, I agree with that. We will not know if it is a technically feasible solution to the satellite approach until 1985. There are some technical milestones that have to be reached before we can be sure that we can build the system.

Second, at that time, even if we can build the system and the technology is proven, is it a cost-effective thing to do with respect to other alternative means that we have for communicating with the submarines that are coming on line, including reconstitution concepts for both VLF and ELF and MILSTAR terminals on the submarines?

So, we will need to take a very thorough look at that before we make a large investment in such a program.

Senator WARNER. Mr. Latham, on another point—as the Congress moved in one direction to achieve deregulation—it may have impacted on national defense. Let us look at Ma Bell.

Would you describe the Department of Defense position with respect to the dismantling of the AT&T network aside from the philosophical standpoint, what effect does this diversification of industry and introduction of competition have upon the problems that you are facing with the C^3 system?

Mr. LATHAM. That is a good question, sir. On any given day here in the United States, some 90-plus percent of our communications are carried by some form of commercial carrier, primarily AT&T, so this divestiture is of significant interest to the Department from the standpoint of how this is going to impact our ability to assure that we have the communications that we need.

The other aspect that impacts this is the Computer II regulatory policy of the FCC. Those two together can potentially impact us in several different ways.

In the Computer II decision, they have decided that what they call augmented service, which is not very well defined, primarily computers in telecommuniaction networks, will not be regulated.

Further, customer premise equipment, equipment on a customer's premises, such as your home telephone, will not be an item that will be part of the telephone company any more. In fact, as you know, they are trying to sell these to their various customers today.

The third thing is the issue of how are we going to assure in DOD under national emergencies, that we have an ability to call a single point of contact and assure ourselves of getting end-to-end connectivity including the customer premises equipment that might be required when we do have a national emergency.

As a result of these kinds of challenges, we are taking several steps to try to get our arms around it.

First, there is a Senate bill being put forward by Senator Packwood that will take one major step for us and that is it will allow the carriers to do planning in support of national emergencies and get around any of the antitrust issues.

Senator WARNER. I have spoken with Senator Packwood about that subject and expressed to him my belief that it is essential that we achieve that.

Mr. LATHAM. Yes, sir. That is an important initiative.

TELECOMMUNICATIONS ADVISORY COUNCIL

Second, we have established an advisory panel, the President has by Presidential order, the National Telecommunications Advisory Council. This group of 20-odd company senior executives have met a number of times and they are discussing among themselves, and we are dicussing directly with the carriers, including AT&T and the smaller carriers, MCI, GTE, and so forth, how to establish a planning staff and a point of contact such that we can pick up one phone and make one phone call to effect end-to-end connectivity if we have any kind of national emergency.

Another issue is that we are examining how to set up a 24-hour command and control center to watch this new diverse network, like Ma Bell does today, in their command and control center up in Pennsylvania. We need to know what is on line and what isn't and what is the status of the system to include not only the long lines, but the and companies as well.

We have a major effort to try to get our arms around this.

There is another uncertainty. We are in an interim period now where many of these things are just in the planning stage and January 1, 1984, is the cutover date on the full divestiture.

TACAMO SYSTEM WITH THE ECX

Senator WARNER. Admiral Nagler, turning to the TACAMO system and the ECX, give us an update on those programs.

Admiral NAGLER. Excuse me, Mr. Chairman, both TACAMO and the ECX?

Senator WARNER. Yes.

Admiral NAGLER. We have TACAMO aircraft, we have three more EC–130 aircraft being delivered this September to raise our total to 18.

In addition, we will have 2 more from 1982 procurement funding to be delivered in 1985 which will raise it to 20. In the 1986–89 timeframe we will have nine TACAMO aircarft reach the end of their extended service life, the EC–130.

As I mentioned earlier, due to the initiatives of this committee, we issued a request for quotation [RFQ] 1 year ago, for replacement of the airframe for the TACAMO aircraft. The requests came back last fall. We are down to the best and final negotiations with one aircraft manufacturer. We are in source selection now.

We expect to go to contract at the end of April on a new aircraft replacement frame. The plan is to take the current communications equipment that is in the TACAMO EC–130's, transfer them to the new airframe as ECX airframes commence delivery in about 1988 and at the same time we are working on R&D to upgrade the communications, but that won't be done until the nineties.

The communication equipment today works very fine in the TACAMO aircraft. The problem is the airframe, and I don't want to go into any detail on that in open session. Communications have grown like topsy over the years with new requirements and we tend to do a better job of bringing communications together.

We will do that in the early nineties so as not to interrupt the ECX procurement.

Does that cover it thoroughly enough, Mr. Chairman?

Senator WARNER. Yes.

Mr. Wilson?

Senator WILSON. Thank you, Mr. Chairman.

GOVERNMENT-OWNED WEATHER SATELLITES

Mr. Latham, perhaps you might comment on the proposed sale of Government-owned weather satellites.

What is the status of this proposal? How does it affect DOD missions and does the Department have a position on the sale?

Mr. LATHAM. Yes, sir, the Department has taken a position on it. There is a letter that we can furnish to you that Mr. Carlucci wrote to the Secretary of Commerce, Mr. Baldrige, stipulating a series of conditions on the sale of the weather satellite program to a civilian or commercial business sector. That letter laid down a number of points that we felt were quite important.

In return they came back and said OK, we agree with your concerns and your requirements in case we do go ahead with this sale.

One of the points, for example, is the distribution of the product from those civilian satellites and others. We can furnish for the record a copy of that letter and the details because it is a classified document.

In addition to that, we are intending to continue to pursue our meteorological satellites. We intend to continue that program for furnishing weather data to the U.S. Forces and other agencies as required. We would see this civilian weather satellite being something that is not going to directly impact the Department of Defense per se. We will have access to that part as well as well as as our own satellite weather data.

Senator WILSON. Thank you. We would be grateful to receive a copy of that letter for the record.

THE DEPUTY SECRETARY OF DEFENSE,
Washington, D.C., December 15, 1982.

Hon. MALCOLM BALDRIGE,
Secretary of Commerce,
Washington, D.C.

DEAR MAC: Should a decision be made to commercialize U.S. civil land or weather satellite systems, there are a number of fundamental concerns which must be addressed and resolved prior to implementing that decision. Our concurrence with commercialization is contingent upon satisfactory resolution of the following:

(1) *System Design:*

(a) *National Security Design Review.*—Civilian remote sensing satellite systems design parameters must be reviewed prior to construction to insure that the resulting data will not reveal information that is not otherwise available to the public and that would be harmful to the security of the United States. A requirement for a national security design parameter review must be included in any contract or legislation. Civil remote system design constraints on spatial resolution, spectral resolution, and other appropriate parameters must be established

and periodically reviewed. These constraints should be made available to the system operator so that systems can be designed to minimize national security review.

(b) *National Security Data Requirements.*—Data produced by commercial satellite systems, particularly a commercial weather satellite system, must meet the data needs of DoD. These requirements must be included in the data specifications of a contract between the Government and a commercial system operator. This would include not only the kind of data but the format and timeliness of delivery of the data, to insure that it is compatible with DoD data software and operational needs. Changes in format that would create significant software modifications could only be made by mutual agreement.

(c) *System Modifications to Meet Security Needs.*—Civilian satellite systems which are identified as critical to national defense may require modification to incorporate features to insure the availability of the data to the USG and to deny use of the system to an enemy in times of national emergency; e.g., [deleted].

(4) *Systems Operations:*

(a) *Priority Needs.*—A private operator must be responsive to the priority needs of DoD and other national security agencies. Collection, processing and data delivery priorities must be incorporated into the contract between the Government and the private owner. Other priorities, such as sensor replacement, satellite launch, orbits, etc. must also be accommodated by contract.

[Deleted.]

(6) *Free Flow of Weather Data.*—The defense weather forecasting and advisory systems use and rely upon a large body of all-source environmental data. Some of this is supplied by foreign entities in an international free exchange of data in which the U.S. participates. This foreign data is important to satisfying the worldwide weather support requirements of U.S. forces. The U.S. Government must, therefore, continue to control distribution and exchange of weather data and no change of the weather exchange policy can be made unilaterally by a private operator. The contractual arrangements between the Government and a private operator must recognize this need.

In making a decision in favor of some form of commercialization, the USG must have an understanding of the manner in which it will ensure these concerns are satisfied, and the resulting financial impact. This must be done prior to implementing any such decision. We will, of course, be pleased to assist in this interagency process.

Sincerely,

FRANK C. CARLUCCI.

Senator WILSON. Why was it necessary to issue the directive contained in the defense guidance?

The administration gives such priority to the C^3 system with the implementation of the President's 1981 strategic force modernization program. Has it been a failure of communication between the Office of the Secretary and the services or have the services simply not moved for some reason?

Mr. LATHAM. It is not that the services have not moved. As I mentioned earlier, we have actually been supported by the services in the resource allocations in this area. We are using the Secretary's defense guidance as a mechanism to convey very explicitly to the services the things that we believe need to be done.

If you look at the fiscal years 1985–89 guidance, it is very detailed guidance. It lays out mid-term objectives, and so on, very, very specifically.

Then tied to those guidance initiatives, specific things that need to be accomplished, is a resource section which lays out the estimated resources in order to get the job done.

In the case of communications, command and control, for example, in the fiscal years 1985–89 area, if you add up all the resources we

are putting into the guidance, we would expect to see even more substantial growth in the C^3 account.

This is not an indication that the services have fallen off or we are trying to whip them back into shape, because we are doing this across the forces in terms of modernization including readiness, everything.

So, the guidance is really very much of a textbook and cookbook, if I can use that term, for the services to come back with their POM's in response to that guidance. If it is vague and not to the point, they can't respond well. We have tried to sharpen it up and make very clear what we need.

Senator WILSON. Thank you.

Does the Senator from Nebraska have any questions?

Senator EXON. I have no questions in open session. I will have some questions in closed session which I understand we are going into at some later time.

Senator WILSON. Very shortly. In fact, we might as well go into closed session right now.

[The prepared statement of General Hansen follows:]

PREPARED STATEMENT OF BRIG. GEN. ALFRED G. HANSEN, DIRECTOR LOGISTICS PLANS AND PROGRAMS, DEPUTY CHIEF OF STAFF/LOGISTICS AND ENGINEERING HEADQUARTERS, USAF

Mr. CHAIRMAN AND MEMBERS OF THE COMMITTEE: It is an honor to present the Air Force Other Procurement Electronics and Telecommunications fiscal year 1984 budget request.

The Air Force Other Procurement Appropriation consists of four budget programs which include Munitions and Associated Equipment, Vehicular Equipment, Other Base Maintenance and Support Equipment and Electronics and Telecommunications Equipment. Special projects contained within the Other Base Maintenance and Support Equipment Program represent nearly 50 percent of our $7.6 billion Other Procurement fiscal year 1984 Budget request. Of the remaining $3.9 billion, the Electronics and Telecommunications request is for $1.9 billion. These funds acquire communications, command, and control (C^3) systems and equipment that range from small hand-held radios to large one-of-a-kind surveillance radars. All C^3 equipment acquired with Other Procurement funds will be used in ground applications only. Other appropriations fund airborne or space borne C^3 systems.

The strategic portion of the Electronics and Telecommunications program will be addressed today. I would now like to briefly summarize our budget request during which I will highlight some of our more significant strategic dollar threshold C^3 programs.

STRATEGIC COMMUNICATIONS EQUIPMENT

Strategic C^3 represents 41 percent of our fiscal year 1984 electronics and Telecommunications Program. We have further divided strategic C^3 into four categories: Strategic Defense, Strategic Command and Control, Space Programs, and Strategic Training and Base Support.

STRATEGIC DEFENSE

In fiscal year 1984 the Air Force requests $403 million to buy Strategic Defense Systems consisting of missile surveillance and warning systems, atmospheric (air breathing platforms) surveillance and warning systems, and space surveillance and defense. Deficiencies associated with age and limitations of coverage makes existing early warning and surveillance networks vulnerable to Soviet exploitation. Therefore, the Air Force has undertaken several research and development programs to correct known deficiencies and provide additional capabilities to meet projected strategic threats. Many of these programs have progressed to the production stage and will require fiscal year 1984 procurement funds. A comprehensive discussion of some of the strategic defense procurement programs follows:

Over-the-horizon backscatter (OTH–B) radar.—OTH–B provides wide area, long-range all altitude surveillance against bomber and air-to-surface missile attacks on North America. Currently deployed air defense radars have a maximum range of approximately 200 miles and are ineffective against the modern soviet bomber and air-to-surface missiles. OTH–B will extend that coverage to 1,800 miles thereby increasing warning time available for survival of retaliatory forces and providing additional decision time for National Command Authorities. An experimental east coast radar system limited to a 60 degree sector was successfully tested in 1981 and is being upgraded to full operational capability using R&D funds. Fiscal year 1984 funds procure two additional 60 degree sectors to expand coverage of the east coast site to a full 180 degrees.

PAVE PAWS.—The PAVE PAWS phased array radar system provides early warning of Submarine Launched Ba listic Missiles (SLBM) over a 3,000-nautical mile range and monitors satellites in low earth orbit. Currently PAVE PAWS are operational in the northeast and northwest with construction to begin shortly on a southeast site. Fiscal year 1984 funds will procure a southwest site and upgrade the southeast site to allow it to assume a greater space tracking role.

DEW line replacement.—The Distant Early Warning (DEW) Line was designed in the 1950s to provide long range early warning of medium and high altitude bomber attacks. It has gaps in coverage at low altitudes and is becoming more difficult and expensive to maintain because of its age. Beginning in fiscal year 1984, the DEW Line will be replaced with minimally attended and gap filler radars. Fiscal year 1984 funds are to procure 11 minimally attended radar systems. Fiscal year 1985 funds provide for the two additional minimally attended radar systems required and begin procurement of the gap filler sites.

Defense support program (DSP).—An operational DSP is a key element of our nation's strategic defense posture. DSP satellites provide data to dedicated ground stations which transmit appropriate messages to the National Command Authorities (NCA), North American Aerospace Defense Command (NORAD) and Strategic Air Command (SAC) in near-real time. Fiscal year 1984 funds provide for modifications to the ground stations to maintain system efficiency and effectiveness. The modifications will ensure continued ground station compatability with evolutionary DSP sensor improvements.

STRATEGIC COMMAND AND CONTROL

In fiscal year 1984 the Air Force requests $170 million for command and control systems to provide early warning, assessment and information to and from military commanders and the NCA. The NORAD Cheyenne Mountain Complex, SAC Command Center, National Military Command Center, Alternate National Military Command Center, and Airborne Command Posts are the vital strategic command and control elements. Measures to improve the reliability, survivability, and endurability of Air Force vital strategic C^3 systems are underway. A discussion of fiscal year 1984 procurement programs follows:

NORAD Cheyenne Mountain complex.—The NORAD Command Post provides the Commander-in-Chief of NORAD the facilities and communications necessary to exercise command and control over his assigned forces and to provide essential decisionmaking information to the National Command Authorities. Of particular concern in fiscal year 1984 is the Space Defense Operations Center (SPADOC). In a phased upgrade of the SPADOC operational capabilities, requested funds will procure hardware required to support capabilities to warn of attacks on U.S. satellites, to recommend defensive countermeasures, and, if deployed, to exercise operational command over the U.S. antisatellite system. The SPADOC hardware is required to handle sensitive, compartmented information and collateral data bases as part of the status monitoring and warning process.

Strategic Air Command digital network (SACDIN).—The SACDIN Program will upgrade and modernize SAC's printed copy command and control communications system to ensure positive control over SAC's missile launch sites and aircraft wings. The existing system is old, obsolete and non-secure. The SACDIN system will provide secure communications with enhanced survivability from National Command Authorities to dispersed missile crew and aircraft wing commanders.

Air Force satellite communications system (AFSATCOM).—The AFSATCOM system satisfies an urgent DOD requirement for reliable communications to en-

sure command and control of the Single Integrated Operational Plan (SIOP) forces and other nuclear capable forces. Fiscal year 1984 funds will enhance performance of ground terminals in a jamming environment and permit transition to the MILSTAR satellite. In addition, these funds will procure equipment required to interface the airborne AFSATCOM secure voice network with selected ground command centers.

Worldwide military command and control system (WWMCCS) ADPE.—The WWMCCS system provides the means for operational direction and technical administrative support to command and control of U.S. military forces. WWMCCS supports the NCA, Joint Chiefs of Staff, Commanders of the unified and specified commands, and the military services and agencies through all levels of crisis and conflict. Fiscal year 1984 procurement funds will provide replacement of several obsolete, difficult to support automatic data processing equipment (ADPE) components. The 1984 request covers six separate projects such as WWMCCS ADPE hardware at NORAD, an upgrade to the United States Air Forces Europe (USAFE) system for Central Command (CENTCOM).

SPACE PROGRAMS

The third portion of the Strategic Communications Procurement Program consists of those ground communications facilities required to support space and missile test ranges, satellite control, space systems operations, meteorological satellites, space shuttle, and space communications security (COMSEC). In fiscal year 1984 the Air Force requests $177 million for these space related programs. A discussion of these programs follows:

Space and missile test organization ranges.—The eastern and western test ranges provide support for the operation of launch and down-range facilities required for a wide variety of missile and space-vehicle tests. Facilities provide telemetry, tracking, optics, timing, and associated data handling computational and communications systems. Fiscal year 1984 funds will continue an improvement and modernization program for each range. Equipment replacements, correction of deficiencies, new capabilities, and communications upgrades will enable the ranges to support new programs such as space shuttle and other DOD, NASA, and other agency test programs.

Satellite control facility (SCF).—The Satellite Control Facility is a national range tasked to support the research, development, test, evaluation, and operation of satellite systems. The SCF mission supports test operations with real time telemetry, tracking, command and control, and vehicle payload recovery. Fiscal year 1984 funds provide for multiplexing equipment for communications circuits, thereby allowing a 50 percent reduction in the number of leased communication longlines. Additionally, they provide for antenna pointing for data retrieval in support of defense meteorological satellites plus fiber optics links at the Guam microwave radio link and COMSEC devices at several sites.

Consolidated Space Operations Center (CSOC).—CSOC will support an increasing satellite control workload, provide a backup in the critical elements of the network to operate these space systems, and enable planning readiness and control systems that fully exploit the Space Transportation System. The fiscal year 1984 funds will procure equipment to be installed in the Shuttle Operations and Planning Complex, Satellite Operations Complex, communications equipment to tie CSOC to ground support facilities such as launch sites and remote tracking sites, and internal communications within the CSOC facility.

Space shuttle or space transportation system.—The Space Shuttle is a key element of our national capability in space. The Shuttle will enable us to put larger volume and heavier payloads into orbit and to examine and repair orbiting satellites. Fiscal year 1984 funds will continue the procurement of communications equipment and navigational aids for the Vandenberg AFB Ground Support System. Additionally funds provide for flight control equipment needed for secure mission operations at Johnson Space Center and for automated entry systems and intrusion detection devices at Vandenberg AFB, Kennedy Space Center, and Cape Canaveral.

Defense meteorological satellite program (DMSP).—DMSP is an advanced weather satellite system which supports both strategic and tactical missions. It is a joint service program and DOD's most important single source of weather data. High quality visual and infrared cloud imagery and other specialized

meteorological data are transmitted from DMSP satellites in low earth orbit. Fiscal year 1984 funds will procure new Mark IV terminals to replace obsolete ground terminals plus test stations to facilitate trouble shooting and thereby reduce down time.

Space systems communications security (COMSEC).—The Air Force is the single manager for COMSEC equipment used in space systems. This includes most of the ground systems used to support space programs. COMSEC equipment protects command telemetry and mission information links of DOD space programs. Fiscal year 1984 funds will procure COMSEC devices to support the Satellite Control Facility, Space Shuttle, defense satellite communications system and special projects.

STRATEGIC TRAINING AND BASE SUPPORT

This category contains strategic combat crew training equipment, and Air Base Ground Defense Systems. The Air Force requests $32 million in fiscal year 1984 for these programs. A discussion of these programs follows:

Radar bomb scoring system (SEEK SCORE).—The SEEK SCORE system consists of a long range precision tracking radar, and ancillary equipment to track bomber aircraft to a predetermined weapon release point, and electronically compute the impact point accuracy upon a simulated weapon release. The system will be used for training aircrews and determining operational readiness. This will replace 1950 vintage equipment that has become very difficult to support. Fiscal year 1984 funds will be used to exercise a firm fixed price production option for two systems.

Air base ground defense.—The Air Base Ground Defense System provides physical security protection for critical operational resources and weapons stockpiles. These include Air Launch Cruise Missile (ALCM) and Ground Launch Cruise Missile (GLCM) sites. The increase in terrorist threats has underscored the importance of the sensory and detection equipment developed and procured for air base ground defense. Fiscal year 1984 funds provide semipermanent and deployable long range detection sensors plus tactical communications radio equipment and securable intrabase radios for the wartime air base ground defense mission. Mobile equipment will also be procured to rapidly expand the communications capability at deployed locations.

Mr. Chairman, this concludes my prepared statement.

Senator WILSON. Thank you gentlemen. We will now proceed into executive session.

[Whereupon, at 2:40 p.m., the subcommittee proceeded in executive session.]

EXECUTIVE SESSION

Senator WILSON [presiding]. Gentlemen, if you will resume your seats, the room has been secured. We will get underway in the closed session.

Mr. LATHAM. I would like to take a few minutes, sir, to give you a top-down view, with some classified material, of where we are going in this C^3 area to include some additional programmatic areas that were not covered in the earlier unclassified session, if I might.

Senator WILSON. Thank you. You may proceed.

Mr. LATHAM. I would like to tell you about how the C^3 system was put together and how it works. I would like to use two vugraphs to give you a view of the Soviet command and control system vis-a-vis the United States.

The C^3I system—what is it—how it works: A view of Soviet and U.S. C^3; building a surviving and enduring C^3I system; major C^3I program initiatives; resources request; other management initiatives, and observations.

To comment on how we are attempting to build a survivable enduring C^3 and I system, I will talk about two programs initially.

One is in the strategic defense area and the second is the improvement of the Worldwide Military Command and Control System [WWMCCS], to show you the resource request in summary and one vugraph on other management initiatives.

[Chart deleted.]

If you look at the fiscal years 1985–89 defense guidance that we are talking about, these are the key phrases in it having to do with strategic forces and the supporting C³I. [Deleted.]

[Deleted.]

[Chart deleted.]

This has significance to the C³I area because in order to be able to intelligently use these reserves you have to have a surviving command and control system to go with it. If you look at the priorities that the defense guidance has for 1985–89, it addresses two major subjects, [deleted].

This has to do with resource allocation and in statements later in the guidance we are putting equal priorities to the acquisition of the C³ system as to the weapons it supports.

The MX and B–1, if you are going to buy those, you have to buy the command and control to go with it. In the defense-wide area the allocations are based on its contribution to the combat effectiveness that it supports.

[Chart deleted.]

If you look at the strategic C³I priority, again it is the President's modernization program and ability to take the first strike and retaliate. Then controlled responses throughout the period of conflict.

I will come back to what we mean by enduring or surviving system and what some of the key points are on that.

[Chart deleted.]

Last, the objectives for strategic C³I noted here. We are to modernize and improve in [deleted] functional areas. You will see our emphasis in here on these various areas.

[Deleted.]

I will speak to the North American air surveillance initiatives in just a minute.

We are putting in a nuclear detonation detection system which is hosted on a navigation and position fixing satellite program called NAVSTAR GPS. We are improving command facilities in several ways to include airborne command posts and other surviving enduring command centers that are mobile. There is a decided move of going to mobile command and control facilities in order to survive the command function.

In the communications area we are addressing communications in support of all of these major subfunctions. As General Randolph mentioned earlier, the keystone of the President's strategic communications program is the MILSTAR ELF communications satellite. The ground wave emergency network [GWEN] is an overlay to the CONUS telephone network to provide enduring communications connectivity to the strategic forces and supporting C³I.

We want to get away from those telephones for aboslute high confidence ability to get messages to the forces and from the forces under any conceivable kind of attack. So, we are putting in a relatively inex-

pensive, highly survivable network that will get us away from having to depend on a commercial phone network for messages.

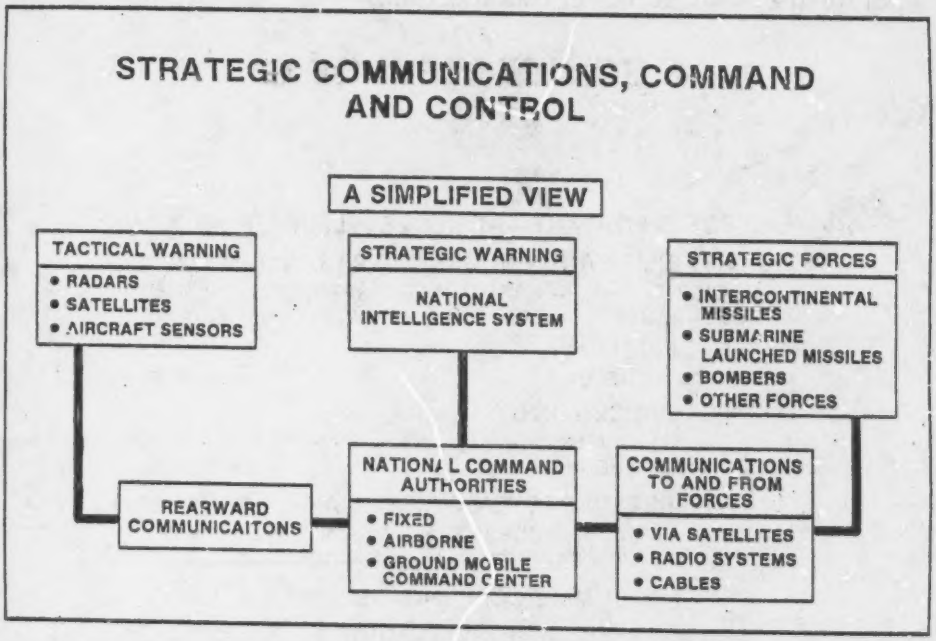
This navigation and position-fixing area is a major initiative. We will have on orbit by 1988 a full constellation of global position-fixing satellites which will give you a unique capability we don't have today for position-fixing in three dimensions to tens of feet and velocity to a few tenths of a foot-per-second and very precision timing.

We are also undertaking satellite mission control survivability measures to assure that we have end-to-end survivability of those very expensive space assets by having the satellite mission control facilities also mobile.

A way to view C³I: The C³I Triad—warning and attack assessment; the command function; and supporting communications.

Now one way to view C³I is to break it down into these three functional areas and then try to assess how well we are doing in each of these areas.

I will go through and show you how these come together in the next Vu-Graph.



If you look at a very simplified view of how this system is supposed to work, the National Intelligence System (NIS) is a term you won't normally find, but I use that as a term to group together all types of intelligence systems that support the function of strategic warning.

That is the type of warning that goes on day to day every day 365 days a year forward processed information into the [deleted] command centers where it is assessed as to the status of forces worldwide. There are a number of very special collection and processing systems that provide this information. Strategic warning as opposed to tac-

tical warning is the type of warning you would be worrying about prior to any shots being fired, so to speak.

In the case of tactical warning, it is the warning you derive from physical sensing of information coming from ballistic missiles that have been launched or other physical phenomenon.

In the case of satellites, we have the [deleted] satellites which are constantly watching ocean areas and land mass areas of the Soviet Union [deleted]. This satellite system can detect an ICBM or SLBM [deleted] launch [deleted].

We are using dual-sensor phenomenology, infrared and radars, to provide tactical warning. This warning information goes through a series of rearward communications which are complex, mostly commercial today, into a series of command centers where the assessment and decisions are made and then through communications of various types to the forces, both the offensive forces and defensive forces.

In this program of strategic C^3 modernization each of these boxes is in some way being improved in the communications, command and control and warning areas. There is a major emphasis on survivability and endurance. New initiatives in the intelligence areas is a separate discussion at higher classification.

A SOVIET VIEW OF C^3

- TERRIBLY IMPORTANT—AT ALL LEVELS/ALL FUNCTIONS
- SURVIVABILITY AND ENDURANCE PARAMOUNT
  - MOBILITY
  - REDUNDANCY
  - HARDEN AND DISPERSE
  - LEADERSHIP SURVIVAL
- BE FLEXIBLE
  - SKIP ECHELON
- EXERCISE THE SYSTEM UNDER STRESS
  - ALL LEVELS
  - ALL THE TIME
- RETAIN PROVEN SYSTEMS/APPROACHES: E.G.,
  - MANUAL MORSE IF NECESSARY
  - HIGH FREQUENCY RADIO IN GENERAL
- COMMUNICATIONS SECURITY A MUST
- ELECTRONIC COMBAT A VITAL MISSION
  - JAM
  - DECEIVE
  - DESTROY
  - EXPLOIT

I thought it would be worthwhile to take a quick view that I created—this is not an official blessing, but this is how I think the Soviets view command, control, and communications.

I think they believe it is terribly important when you look at the level of investment they are putting in this area. They exercise the system constantly. They pay attention to survivability and endurance. They have taken a different approach than we have. [Deleted] hardened command centers. We have two.

[Deleted.]

They have [deleted] of C^3 bunkers all over the Soviet Union. They have a good communications security program and they believe that what I call electronic combat is a vital mission. They are going to attempt to jam, destroy, and exploit our system and that is an integral part of C^3I.

[Chart deleted.]

In the next Vu-Graph I tried to compare the two nations' command and control systems. [Deleted.] They have provided [deleted] places for the leadership to go. [Deleted.] We are placing emphasis on airborne mobility for survivability.

We talk about the national emergency airborne command posts. These are the four 747 modified aircraft to support the President. There is an airborne aircraft, which we keep up 24 hours a day to support command and control functions for the strategic forces. We are moving toward enduring command and control capability using mobility, deception, and covertness.

Summarized over here is an awesome rendition of what he has attempted to do [deleted].

Senator WARNER. Does this lead once again to the conclusion that the Soviets are modernizing toward a capability of conducting intermittent on a limited series of nuclear exchanges and facilitating any first strike decision that they might reach?

Mr. LATHAM. Yes, sir, it would appear so.

Senator WARNER. It is clear to me from what we have learned this morning and what you are adding this afternoon that we are moving toward that capability.

Mr. LATHAM. Yes, sir.

Senator WARNER. Admiral, would you agree with that?

Admiral NAGLER. Yes, sir, completely, Mr. Chairman.

[Deleted.]

Senator WARNER. They have that system in operation?

Admiral NAGLER. [Deleted.]

A VIEW TOWARD ENDURING C^3I SYSTEMS

- FIXED SENSOR C^2 AND COMMAND C^3 CENTERS ARE TOO VULNERABLE
- RECONSTITUTION MUST BE DESIGNED INTO THE ARCHITECTURE
- WAR AND PEACETIME CAPABILITIES DIFFER - NO NEED TO RECONSTITUTE IT ALL
- VIEW THE PROBLEM AS A DUAL SYSTEM CONCEPT
- SURVIVING BATTLE STAFFS AND INTELLIGENCE PERSONNEL CRITICAL
- MUST EXERCISE IN PEACETIME: REGULARLY
- A MAJOR FACTOR IN DETERRENCE

Mr. LATHAM. One view toward an enduring C^3I system is emphasizing, in our judgment, that fixed command and control sites are

vulnerable. Why are the Soviets building some? I am not sure but they are building them [deleted]. I think they are counting on deception to further enhance their survivability.

Senator WARNER. We are moving toward a mobile system?

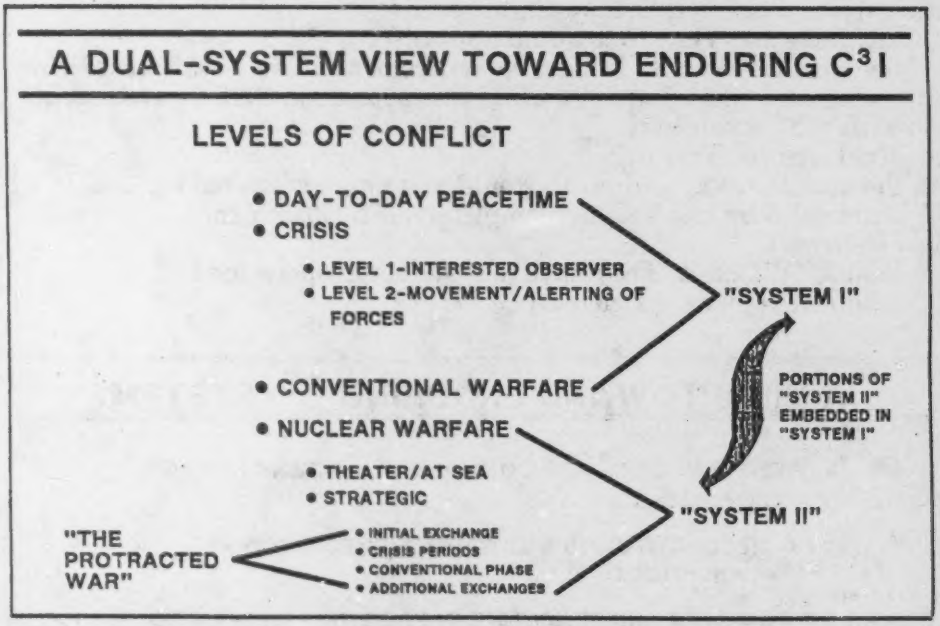
Mr. LATHAM. Mobile system to assure command decision survivability from the NCA down.

Senator WARNER. For the United States?

Mr. LATHAM. Yes, sir, you must, however, in designing an enduring system build some sort of reconstitution into some parts of it. We are looking at how you would reconstitute ELF and VLF and other pieces of the system. You don't have to reconstitute all. You have to look at a dual system concept. You have a system for peacetime, crisis, or conventional war and another system for wartime nuclear engagement.

I will show you a little more on that in a second.

People are critical. How do you survive these critical battle staffs and intelligence processing people, and so on? This is a detailed problem, how you get the people to survive. You have to exercise it. If you can put this all together, I think it will be perceived and in fact it is a main factor in deterrence. If he knows you can control your forces under any set of circumstances, that is a deterrent.



What I would suggest is that you can view this in a very conceptual way as a two-level approach. System one does the function shown at the top. System two does these functions at the bottom with great portions of system two embedded in system one.

You have MILSTAR and that is what I would call a system-two initiative if you really want to say I need an absolute surviving capability for command and control for these kinds of engagements. I will put that on line in peactime. I will use that and use it as part of system one, but it is a very important piece of system two.

I am putting GWEN, the ground wave emergency network, in. I can't justify GWEN for peacetime or conventional conflict. It has to be justified on this. GWEN can be viewed as a system two type of appoach to communicating with the forces. So this is the conceptual way to view surviving and enduring C^3. You can take all the various programs and kind of catalog them into system one and system two to justify whether each is a conventional crisis system or one that supports strategic warfare.

A C^3I Architecture Approach

View the construct toward enduring C^3I as a two-system problem: System I—peacetime/crisis/conventional war and system II—strategic and theater nuclear war.

Focus system I architecture on: strategic warning; tactical warning; attack assessment; crisis management; support of conventional war operations; and peacetime support.

Focus system II architecture on: [Deleted.]

[Deleted.]

Senator Warner. Would we have a dual system then, one immobile and one mobile, and would they be fully redundant?

Mr. Latham. They would not be fully redundant. [Deleted.]

It is a much more austere capability, but still enough [deleted].

I would like to show you another view of these enduring C^3I requirements. This is my personal view and not blessed by anyone.

[Chart deleted.]

Why do you want to buy this enduring system because that costs money? First and foremost you must have absolute control [deleted]. That is the first and foremost reason for buying an enduring C^3I system.

[Chart deleted.]

[Deleted.]

[Chart deleted.]

Next, you want to have a system that underwrites deterrence. It has to be visible. It has to be decisive. It has too be able to be perceived that in fact it is actually a deterrent.

Next, you want to have a system that is a sufficiently complicated one in its construction and sufficiently difficult to take out that he can't sit down and think through what I call a "set piece campaign" as to how he is going to defeat it.

[Chart deleted.]

Lastly, I arbitrarily say, when you are asking about endurance, [deleted] just arbitrarily because we are continually asked that question. I picked a number.

That in summary, is what we see as an enduring system and its requirement.

Now, we talked about several of these initiatives before, but I thought I would summarize a couple others. We are making a number of upgrades to our warning satellites.

Senator Warner. Let me interrupt you. You put the emphasis on mobility. Is that in the open?

Mr. Latham. To some extent it is and to some extent it isn't. Obviously the national airborne emergency command post and the fact that we have the looking glass up 24 hours a day, things of that nature are certainly well known. [Deleted.]

I think it should be protected.

[Deleted] and in the out years some others will have a number of upgrades to enhance their survivability and will have communications upgrade such as [deleted].

WARNING AND ATTACK ASSESSMENT INITIATIVES

Survivability upgrades to warning satellites—mobile ground terminals for warning data readout—two new PAVE PAWS radars—Southeast and Southwest.

Modernization of BMEWs radar systems—new computers and radar improvements.

Advanced warning concepts in R&D—integrated operational nuclear detonation detection system [IONDS]—hosted on the Navstar satellites is a vital program.

We are buying six mobile ground terminals for [deleted]. The first of these is available in [deleted]. They will be accompanied by satellite communications terminals so that we will have the ability to survive and to read out these data from satellites with mobile facilities. This is an example of what I was talking about. I mentioned two new PAVE PAWS radars. We are modernizing BMEWS. The computer upgrades are almost completed and radar improvements at two sites, are programed. An advanced warning concept is in early R&D. We will decide by 1987 if we can build a better warning system than we have today, with improvements such as more onboard processing so that low rate data will go to multi users simultaneously.

Then, of course, we are deploying the IONDS. IONDS is a device that will detect nuclear detonations above the surface of the earth. [Deleted.] From the information available from IONDS you can get damage assessments on the enemy and damage assessments on yourself in real time. It will be possible to know which target has been hit and how badly you have been hit.

[Deleted.]

STRATEGIC COMMUNICATIONS INITIATIVES

Ground wave emergency network [GWEN]: Low frequency—resists nuclear effects and jamming; many nodes—survivable/enduring; CONUS wide—connectivity; and many uses—SAC/NCA/Forces.

New ECX aircraft for TACAMO.

Milstar EHF communications satellite system: Extremely resistant to jamming and nuclear effects; numerous survivability options incorporated; and assured connectivity—NCA and forces; force commanders and weapon systems; and report back.

LF/VLF receivers on bombers; DSCS III production; ELF for communications to submarines; three additional fleet communications satellites; and reconstitutable communications concepts under study.

In the communications area General Randolph has mentioned most of those. We talked about ECX. ELF has been described to you. We are buying three additional FLTSATS, numbers 6, 7 and 8. Seven and 8 will have an applique EHF package on it which will be a test package and an austere communications capability until MILSTAR comes on line.

[Deleted.]

[Chart deleted.]

Let me talk about two other major program initiatives that haven't been covered so far. We are talking about Strategic Defense as op-

posed to North American air defense or ballistic missile defense, or space defense in isolation.

[Chart deleted.]

We have taken air defense, space defense, and ballistic missile defense and put them together under a strategic defense program. This is a major DOD initiative led by General Hartinger, Commander of NORAD.

[Deleted.]

We will take these in phases and do these gradually as the technology and the money become available—with full Canadian participation.

Phase II will be strategic defense architecture. This is due to the Secretary of Defense in March 1984. Phase I will be reported out in September 1983. Phase II will build on Phase I. This will be an integrated plan across these three mission areas. This is the first time we have done this. [Deleted.]

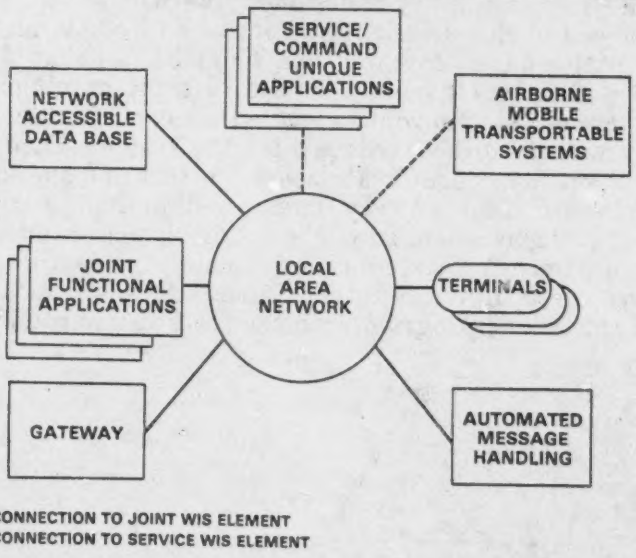
WWMCCS Information System (WIS)

Program to modernize WWMCCS ADP—funding: R&D fully funded.
[Deleted.]
Program under focal point control of WIS joint program management.

I thought I would touch on one other major issue. This will eventually be a very expensive program—known as the WWMCCS Information System (WIS). It is a modernization of the advanced data processing in the many sites we have around the world. This is under General Evans. You remember he was here last year talking about this. We have a problem defined and the R&D is fully funded.

[Deleted.] It has a specialized management set up in which there is a joint program office here in Washington.

NODAL SYSTEM STRUCTURE
WIS



The Air Force is the lead service for executing the program. It is an ambitious program. It is going to bring new technology to our WWMCCS site. We will change the architecture at each site. We will put in a local area network. You can "hang" on this network various types of equipments and tailor the equipment at each of the command sites to what they need to support that particular command, be it CINCLANT, versus CINCPAC, versus CINCNORAD.

There will be new hardware and a great deal of new software. Importantly again, airborne and transportable systems for survivability of the ADP in the event of hostilities, is part of the architecture.

WIS ACQUISITION

- FUNDING ($M):

	FY 82	FY 83	FY 84	FY's 85-88
RDT&E	$21.4	$29.0	$44.6	$374.4
PROCUREMENT	—	—	—	$214.5

- MILESTONES:
  - JOINT PROGRAM MANAGEMENT OFFICE (JPMO) ACTIVATED — JAN 1982
  - JOINT MISSION ELEMENT NEEDS STATEMENT (JMENS APPROVED BY OSD) — FEB 1982
  - WIS MODERNIZATION REPORT TO CONGRESS SUBMITTED — JUL 1982
  - WIS JPM CHARTER APPROVED — SEP 1982
  - INTEGRATION CONTRACT — 3RD QTR CY83
  - COMMON USER CONTRACT — 4TH QTR CY83
  - DSARC II — 2ND QTR CY84
  - INDEPENDENT VERIFICATION AND VALIDATION CONTRACT — 3RD QTR CY84
  - JOINT MISSION CONTRACT — 2ND QTR CY86
  - JOINT MISSION PROCESSING—WWMCCS-WIDE — 2ND QTR CY89

We have a gradual ramp up as shown, with fiscal year 1984 being a request for $44.6 million. We don't start hardware procurement until 1985.

Here are some of the key milestones. We will be working on this through the rest of this decade. The approach is to have an integration contractor with a hardware exclusion. The RFP for that is going to be released very shortly. He will do the detailed system integration work. Later on there is a second contract called the common user contract in which they will have the hardware for the system. Then there is an independent verification and validation contract to make sure the software is as claimed. This is a very strong joint mission program. I think we have a pretty good plan. It will be a difficult plan to execute because it involves all four Services and many, many different users.

This week, here in Washington, General Evans held a 2-day conference on this whole program with the users from around the world.

It really was quite successful in getting people to believe we are finally going to modernize WWMCCS.

COMMUNICATIONS COMMAND AND CONTROL (C^3) MISSION AREA STRUCTURE

STRATEGIC C^3	THEATER & TACTICAL C^3	NAVIGATION/ WARFARE COMMAND & CONTROL	SUPPORT & BASE COMMUNICATIONS
• STRATEGIC C^2 • STRATEGIC S&W • STRATEGIC COMMS	• THEATER C^2 • THEATER COMMS • TACTICAL C^2 • TACTICAL COMMS	• LAND WARFARE • AIR WARFARE • NAVAL WARFARE • NAVIGATION & POSITION FIXING	• SUPPORT COMMS • BASE COMMS

EW & C^3 COUNTERMEASURES	COMSEC	INFORMATION SYSTEMS AND DEFENSE COMMUNICATIONS SYS
• SELF-PROTECTION • ESCORT; STAND-OFF & COUNTER C^3 • TACTICAL SURV., RECCE. & TARGET ACQ • MULTIMISSION, TECHNOLOGY & SUPPORT	• COMMUNICATIONS AND SIGNALS SECURITY	• INFORMATION SYS • COMPUTER SECURITY • LONG HAUL COMMS • COMM. SERVICES INDUSTRIAL FUND

EFFECTIVE MAY 1982

1005-2

The resource area, if you look at the entire command and control communications area, involves these many things shown here and includes communications security, electronic warfare systems—we are talking about this piece in the left-hand corner—strategic C^3, although what I was talking about in the WWMCCS area is in the information systems area as shown here.

[Chart deleted.]

The total request for C^3I is [deleted]. We are not going to talk about centrally managed intelligence or tactical intelligence and related areas. That constitutes [deleted]. The rest of this, C^3, we are talking about is $16.7 billion.

Senator WARNER. Is that Government-wide?

Mr. LATHAM. Let me explain that. The National Foreign Intelligence Program—NFIP—if you look at the budget request that was sent in by Mr. Casey, this number is [deleted].

[Deleted] is what is executed within defense. There is approximately [deleted] that is in the NFIP for other agencies [deleted].

[Chart deleted.]

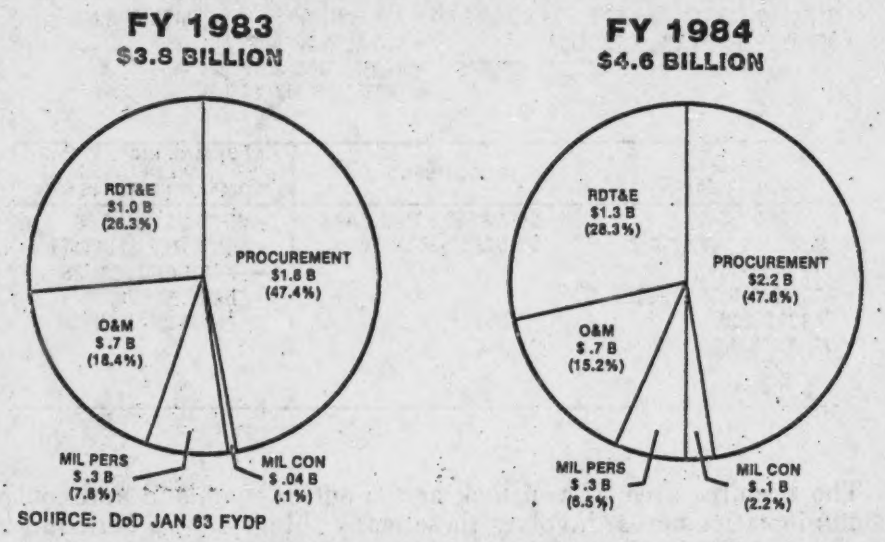
We mentioned the growth in the program. It is about [deleted] percent for C^3, about [deleted] percent for I, so the C^3I area aggregates about [deleted] percent growth area from fiscal year 1983 to 1984.

[Chart deleted.]

If you look at the resources by mission area, for 3 years this shows you the growth we are talking about, $12 billion in 1982 up to $16 billion in 1984. You can see the growth in the strategic area. Some of the

growth in the strategic area is attributable to the fact that we took some programs and moved them in fiscal 1983, budgeted them differently in 1984, and counted them in strategic. It is a good healthy growth area and we really appreciate the support you have given us in achieving these types of numbers.

Strategic C3 by Appropriation



SOURCE: DoD JAN 83 FYDP

If you look specifically at strategic then, about 48 percent of the request in 1984 is for procurement. That is up to $2.2 billion as opposed to $1.8 billion last year. R&D is up $400 million. O&M about the same. MILCON is a very small piece of the total program.

Strategic C3

Sub-Mission Area/ Appropriation	($ In Millions) FY 1982	FY 1983	FY 1984
Strategic C2	$ 501	$ 541	$ 734
Surv. & Warning	956	1224	1539
Strategic Comms	1578	2015	2359
Total Strategic C3	3035	3780	4632
RDT&E	798	985	1283
Procurement	1350	1802	2211
MILCON	12	35	80
O&M	651	711	795
MIL PERS	224	247	263
Total Strategic C3	3035	3780	4632

Source: DoD Jan 83 FYDP

If you look at the breakout of the total strategic C^3 area and see where it is going, here again are the three main parts of the C^3 Triad, again totaling a 4.6 request for 1984.

If you look at it again by these accounts, it is as shown here.

A C^3I ASSESSMENT

- PRIORITY RECOGNIZED
  - -DEFENSE GUIDANCE OF SECDEF
  - - BY THE PRESIDENT

  > BY BUDGET REQUEST

- MODERNIZATION PROGRAM DEFINED/UNDERWAY
  - - TO INCREASE SURVIVABILITY/ENDURANCE
  - - IMPROVE CONNECTIVITY
  - - INTEGRATED WITH FORCES PACKAGE
- A SURVIVABLE AND ENDURING C^3I SYSTEM WILL:
  - - STRENGTHEN DETERRENCE
  - - PROVIDE STABILITY AND ESCALATION CONTROL
  - - PERMIT TRADEOFFS FOR ADDITIONAL WEAPONS
- A C^3I COUNTERMEASURES CAPABILITY IS REQUIRED
- THE INITIATIVES TO "FIX" PROBLEMS ARE:
  - - NOT ALL THAT SIMPLE
  - - WILL TAKE TIME
  - - WILL REQUIRE SUSTAINED SUPPORT

If I were to give you an assessment, I think the priority is recognized, it is certainly recognized in defense guidance and by the President in statements he has made. We have the modernization program well underway. It is well integrated into the force's package, especially using the nuclear weapons master plan as the vehicle.

We believe again an enduring and surviving system is an important aspect to strengthening the deterrent and providing overall stability. This term "escalation control" means you must be able to absolutely control weapons.

We have to have a countermeasure capability.

The problems are fixable, but it is not going to be simple and it is not going to be done overnight.

Nuclear weapons master plan: C^3I/forces/policy/logistics and reconnaissance systems review.

North American Air Defense plan: U.S./Canada cooperation and programmatic implications.

Conventional air/land capabilities: second echelon interdiction and JSTARS/JTFP/JTACMS/JSEAD.

Lastly, there are some other management initiatives underway. In the master plan, as I mentioned, this last year we added logistics to it. We did a review of all intelligence systems and reconnaissance systems. It has been folded into the nuclear weapons master plan. The North American defense plan was presented to Congress last year. As I mentioned, we are looking out to the year 2000 in that plan.

There is another major initiative having to do with C^3I in the conventional air-land battle capability.

That is it.

Senator WARNER. Thank you.

Admiral Tomb?

STATEMENT OF REAR ADM. PAUL D. TOMB, VICE DIRECTOR, JOINT STRATEGIC CONNECTIVITY STAFF

Admiral TOMB. What I would like to do is show you three slides which will be a summary of what General Davis presented to you and submitted for the record.

I will break it down in summary analysis, tactical warning, attack assessment, EAM dissemination and command centers.

[Chart deleted.]

Mr. Latham has reviewed what programs we have ongoing. This is our summary of what that presentation is that shows the problems as they exist and what we are doing about them, including the lack of the worldwide tactical warning coverage as Mr. Latham suggested.

We do have a PAVE PAWS in the Southeast and Southwest in the program years and we will be studying right now whether we [deleted]. We do have [deleted] improvement which we also address.

The time and tactical warning information [deleted]. We do have a jam resistant communications system going into effect [deleted] which will link [deleted].

So, we do have a capability to penetrate a jammed environment.

The GWEN system will go into effect, which will connect across the continent at approximately 35 stations, which will be in operation in late 1984, early 1985. The MILSTAR system will be our backbone. It is a technically oriented system which we need to get up. We have gotten good support from this committee in the past and we hope to receive that support in the future.

The mobile ground stations will relieve us of our dependency on getting our [deleted].

There is in the R&D effort in the Air Force advanced warning system which is ill-defined right now, but there is money in the program.

The survivable satellite C^3 system will relieve us of that [deleted] we rely on at Sunnyvale which is a fixed geographic point. It will give us the capability to control our satellites [deleted]. [Deleted] in the IONDS system which has been addressed previously in the command center area. We see [deleted].

[Chart deleted.]

The Air Force does have a program right now to put secure voice on the AFSATCOM which is a rider on the FLTSAT satellite. That will give us [deleted] in the right direction.

There is a request in to study a capability to have a continental secure voice capability in near term and again the MILSTAR program will address the long-range, long-term capability which we have to support. [Deleted.]

At the national levels we are working on EMP protection upgrade capability. Much of this is done with the commanders-in-Chief initiative funds. When necessary we go in and get funds from the various Services.

[Deleted.]

There is a mobile command center effort underway now under the direction of the Army which has sufficient funding in it right now. [Deleted.]

[Chart deleted.]

That will carry over into CINC's capabilities, for both EMP upgrade and WWABNCP.

There is funding to upgrade the capability of the communications system in the WWABNCP aircraft. There is a program in the Air Force to look and try to determine a suitable airframe for WWABNCP replacement.

There is an effort, addressed before by Mr. Latham and will be addressed by both Admiral Nagler and General Randolph, on what we are doing to harden tactical warning systems. We are working very hard to try to get interoperability with our 616A and verdin communications systems. We now have proven the technical interoperability of those two systems. We have got the MEECN master plan approved so that we can go out with the Services and the CINC's providing procedures so that system will work and that is really our survivable link right now.

Admiral Nagler will address the ELF. The GWEN program we feel must be married with the AACE program which is a hardening of the wing command post in the Air Force.

The GWEN program will give us capability to transmit [deleted].

I believe Admiral Nagler will address the E–6 in the future. You will see that MILSTAR is a heavy player in everything we are doing in the connectivity arena. We have to go forward with the MILSTAR program.

I think the rest of those systems will be addressed in the following presentation here, the ERCS replacement; they are looking at an ERCS emergency rocket communications system. We are looking at a mobile capability to put up a rocket communications system augmenting the Minuteman capability we now maintain at Whiteman Missile Base.

That is all I have to say. I am ready to answer any questions.

Senator WARNER. Any wrap-up from the other witnesses?

Admiral NAGLER. No; I am ready for any questions.

STATEMENT OF MAJ. GEN. BERNARD P. RANDOLPH, U.S. AIR FORCE, DIRECTOR, SPACE SYSTEMS AND COMMAND, CONTROL, COMMUNICATIONS, DEPUTY CHIEF OF STAFF, RESEARCH, DEVELOPMENT AND ACQUISITION

General RANDOLPH. May I show you a couple of charts?

Senator WARNER. All right.

General RANDOLPH. I just want to point out a little bit more the details of the MILSTAR. This shows the budget request we have for fiscal 1984. This is for the spacecraft only portion. The terminals are in another line.

The point I want to make is that we have settled on a configuration which will be seven spacecraft as part of the baseline configuration with spares. Those satellites will be highly survivable. They have nuclear survivability, laser hardening and will [deleted] have high AJ protection in the extremely high frequency range. That is 44 gigaHertz and 20 gigaHertz.

It is a highly survivable platform and I think will satisfy the requirements that have been identified by Admiral Tomb.

This chart has terminal work. Although it says AFSATCOM, for simplicity's sake to make sure those terminals the Air Force is specifically responsible for in the MILSTAR area are being carried in that particular line.

The Air Force will handle the airborne portion of the terminal development work.

I am prepared to address any questions that you may have on the programs.

Senator WARNER. Senator Exon, would you like to lead off for a change.

Senator EXON. Thank you, Mr. Chairman.

Gentlemen, I would like to congratulate all of you for a very excellent presentation. It is very informative. I would like to have a response to a question from both Admiral Tomb and Admiral Nagler with regard to another excellent briefing that we had from General Davis this morning, with regard to his activities.

One of the charts that they showed us was how we would anticipate where an attack might come from and one of the matters that we spent some time on, of course, was the Soviet submarines off our shores.

I did not get into this question with them because I thought I would save it for you. I assume that those are noisy Soviet submarines. Are they?

Admiral NAGLER. Yes, sir, relatively speaking, [deleted] yes, sir.

Senator EXON. Are they noisy enough so that we know where they are, how close they are to our shores? Do we have them pretty well identified at all times as to the general, if not a specific, area in which they are operating?

Admiral NAGLER. [Deleted.]

Do you want to add to that?

Senator EXON. Admiral Tomb, do you want to add anything?

Admiral TOMB. We have some problems at various times, Senator Exon. [Deleted.]

The Soviets are very astute submariners and they are learning rapidly.

Senator WARNER. Senator Exon, one of the advantages that the United States has is at certain choke points. [Deleted.]

In a wartime scenario we have to assume that [deleted]. Then down to the geographic constraints of the choke points and the noise.

[Deleted.] Maybe you want to emphasize that because I don't want to leave the impression of the Senator in the record that we have an [deleted] system.

Admiral NAGLER. I certainly hope I didn't leave that impression. The Soviets have made great progress over the years [deleted]. The more progress they make in this area the more difficult it is for us [deleted]. So it is not a simple solution. The oceans are not transparent.

Senator WARNER. Also they can launch dockside almost all of their systems now under their targeting doctrine; is that correct?

Admiral TOMB. [Deleted.] However, Senator Exon is talking about those ballistic missile submarines which happen to be near our shores.

One of our other problems—is the advances they have made, as you well know, in oceanographic research. They are learning more and more about such things as the [deleted] to better operate their submarines in an optimum fashion.

They pose new problems all the time to us and we are trying to stay ahead of them. I think it would be better to address the problem with Admiral McDonald because he deals with it daily.

[Deleted.]

Does that answer your question?

Senator EXON. Yes; I think that answers it.

Let me ask one followup question. Is their submarine forces near our shores stabilizing? Is it going up, remaining the same or going down?

Admiral NAGLER. [Deleted.] I would say normally it [deleted].

Senator EXON. Do they stay generally about the same distance from our shores?

Admiral NAGLER. [Deleted.]

Senator EXON. They have not changed their [deleted].

Admiral NAGLER. I would like to take that for the record because I haven't looked at that in that detail. [Deleted.]

With your permission, I would like to take that for the record.

Senator EXON. Thank you.

[The information follows:]

YANKEE SSBN OPERATIONS

Admiral NAGLER. [Deleted.]

Senator EXON. I am particularly concerned about, and I tried to pick up what I could out of the presentation that you made, C^3 and about our ability to communicate after a strike.

Admiral Nagler, if you could take whatever time you think is necessary to amplify in layman terms as much as you can some information to the subcommittee in regard to a chronological breakdown of how the national command authority would communicate with and execute the single integrated operational plan with respect to our Poseidon and our Trident submarine force; if possible, provide a breakdown of the future plan for reconstituting the Navy's strategic C^3 for a post attack phrase.

In other words, we keep talking about how we are going to respond. Could you amplify on that some and what initiatives the Navy believes are essential to provide enduring strategic C^3 capability?

Those are some of the questions that are on my mind. I have tried to give you a broad enough question, so you might take some time to answer it.

The ELF advancements that we are making, how are we doing on that? Are you more sold on that program than you have been in the past? Are things going along all right on the ELF program?

Admiral NAGLER. Senator Exon, I will try to take each question one at a time if I could.

Senator EXON. Yes.

EMERGENCY ACTION MESSAGE

Admiral NAGLER. The emergency action message that you have heard me refer to as an EAM is sent from the national command authority to all three legs of the Triad, the Air Force bombers and ICBM's and the Navy FBM's. [Deleted.]

The key to our connectivity with our FBM submarines is [deleted] communications. [Deleted.]

The very low frequency transmission penetrates the water down a number of feet, [deleted]. Then we have low frequencies and we have many other stations spread around that transmit low frequency communications. Then we have high frequency communications.

The submarine today must [deleted] and that keeps the FBM submarine [deleted] that communication. That doesn't make the submarine vulnerable though. [Deleted] that will make that submarine vulnerable.

Senator EXON. In other words, what you are saying, Admiral, is that they can come up, do the [deleted].

Admiral NAGLER. [Deleted.]

APL-Johns Hopkins has done all kinds of factual studies on this and in the last 15 years we can show that we maintain connectivity with our FBM submarines [deleted].

Senator WARNER. Alert and mod-alert force?

Admiral NAGLER. Yes, sir, I was going to try to stay away from that. The alert force is those submarines on alert, actually on station ready to carry out their mission from a fleet ballistic missile standpoint.

[Deleted.]

When I get to the ELF I will show you how this will help those mod-alert ships. The alert forces are in continuous communications. [Deleted.]

Now, we also have a national emergency command post that is airborne, run by the Air Force. The various commanders in chief have their airborne command posts. We have what we call TACAMO.

Senator EXON. Is it one of our airplanes flying around?

Admiral NAGLER. It is a Navy aircraft. [Deleted.]

These aircraft, EC–130Q aircraft, have VLF, and low frequency transmitters, satellite communications, and high frequency communications. They maintain an orbit in order to communicate with these FBM submarines.

With the Trident submarine coming on line, with *Ohio* the first Trident submarine out now, the operational areas of our FBM submarines are growing much larger. When they get the D–5 missile in Trident it will give them a much improved capability.

So, we will have a bigger area that we have to provide communications to FBM submarines in both the Pacific and Atlantic.

The current TACAMO aircraft of which we have 15 right now are old. They are wearing out. They are slow. They are overweight. We have added satellite communications to them and things like that. Consequently these aircraft can no longer properly perform their mission.

We must take off fuel, not fully load them with fuel, in order to fly today because of their overweight status. [Deleted.] They really don't have the speed to get out there fast.

[Deleted.]

In [deleted] nine of these aircraft will be over their extended life and will no longer be usable and will have to be replaced. Due to the initiatives of Senator Warner and this committee several years ago we started on what we call an ECX. Now it has been named the E–6.

This is replacement aircraft that will have longer range, higher speed, can patrol the Trident op area, can handle additional responsibilities, will be electromagnetic protection hardened against high altitude nuclear blasts and will be much more enduring and will last us 30 years.

That contract is now in the final phases of source selection and will be signed in the latter part of April. It's the AWACS airframe already [deleted] with our VLF associated communications equipment.

We believe and the Chief Naval Operations—yesterday I was in his office to talk to him—said that is the most vital Navy program he has in strategic connectivity—to give that connectivity more enduring capabilitiy.

Senator EXON. That program is on line and on time, Admiral?

Admiral NAGLER. It is on time and on cost right now, but until the contract is signed in another month we are in a——

Senator EXON. You are up to speed on the contract? You are moving as planned?

Admiral NAGLER. Yes, sir.

Seenator EXON. There is nothing holding it up?

Admiral NAGLER. Right now it is normal negotiations between the contractor and Navy trying to get the cost refined. It is not holding it up. It may be a month behind what we hoped it would be, but it is hard-nosed negotiation that is going on now to get the best price for the aircraft.

That TACAMO is our [deleted]. Even if they blow up our shore bases, [deleted].

[Deleted.] So there is a net. It has worldwide military control, the WMMCCs system that you have heard about.

Let me shift now from TACAMO and I cannot emphasize too much that ECX is critical to enduring connectivity for FBM submarines, especially with the new Trident submarines to cover a larger area. We cannot do that with the current old aircraft.

Senator WARNER. You might point out one is propeller and the new one is Jet.

Admiral NAGLER. The current one is a straight C–130 aircraft. This is the new jet 707. We have a lot of commonality with the Air Force. The production line is still open on AWACS aircraft.

Hopefully, that will make it cheaper and keep the production line open. There are changes you have to make. When you trail 5 miles of antenna you have to build the tail up a bit.

EXTREMELY LOW FREQUENCY

Let me get to the extremely low frequency program called ELF. That has been a very controversial program, especially in some areas in the upper peninsula in Michigan and Wisconsin, and it has been known by many names. It has been ongoing for 20 years.

President Reagan, when he came into office, directed that we proceed with the ELF and this committee concurred with that, and the last Congress approved it. It is currently an installation in Wisconsin of 28 miles.

Senator EXON. I know what it is. How is it working?

Admiral NAGLER. Is it working well. When Congress gave us permission to proceed we reactivated the Wisconsin facility. We now have experimental receivers in six submarines [deleted].

[Deleted.] Reception has been everything mathematically we expected it to be with just one test site. We are now going on contract in the State of Michigan just outside of the K. I. Sawyer Air Base in the Michigan State Forest to build another transmitter in Michigan which will be connected with the transmitter in Wisconsin. That construction should start this fall.

We are right on schedule. The initial operational capability with the first prototype receivers will be 1985. We are going to equip all submarines, both SSN's and SSBN's with this capability. It is a very slow data rate. If you know how it operates, I won't go into detail.

Senator EXON. We know it is supposed to be slow. The main thing is that we have a submarine down there someplace, you are able to communicate with it and you are sold that this program is working and it also is moving pretty much on schedule.

Admiral NAGLER. I am very sold on ELF. I believe it is vital. It is a bellringer. It cannot send emergency action messages, but it can send information [deleted]. She can get a signal like ABC in anywhere from [deleted]. We think it is vital. If it goes off the air, the submarine knows something has happened and can come up and receive other communications.

Another thing I forgot to mention. Admiral Tomb mentioned earlier the VERDIN communication system [deleted].

We also have a minimum essential emergency communications network. I won't bore you, but most of the things I have just mentioned make up that network. We test that regularly, worldwide, Army, Navy, Air Force, and the TACAMO and the submarines and how that works. That is constantly tested.

In the future the ECX and MILSTAR—MILSTAR is vital to this program also. The military strategic tactical satellite will [deleted].

We now are in a full-scale development of a submarine [deleted].

[Deleted.] We feel that program is right on track. We will have it in 1986 for the initial testing.

Mr. Latham mentioned FLTSAT 7 and 8. We are putting a package in coordination with the Air Force, the same technology they are doing with MILSTAR, on FLTSAT 7 and 8 which will allow us to test the submarine transmitters and receivers before MILSTAR becomes operational so that we will field it with our equipment when MILSTAR is operational.

RECONSTITUTABLE SYSTEMS

I should like to get into reconstitutable systems. [Deleted.] In open session the question was asked me about blue-green lasers and how much money was in that. I personally think that we ought to be

putting our money in reconsitutable systems other than blue-green or any large amount of money in the out years and instead put that money more in reconstitutable systems.

[Deleted.]

[Chart deleted.]

This chart is one that the Chief of Naval Operations used about a month ago to brief [deleted] on our connectivity. The red is when you are under attack today, what will happen.

These are Poseidon and Trident missile launchers that are connected. If we were under attack today, this is what we think we would have available to launch. Day to day under no attack, no stress environment we are [deleted].

When we get the ELF right here it will increase our capability to do that. When we get ECX it will increase our capability like this. When MILSTAR comes on line with ECX we feel we will [deleted].

Today if we had an out-of-the-blue attack, we would have a problem in maintaining [deleted] percent connectivity as we can do in an unstressed environment.

Again due to the initiative of this committee, we now have a plan with a near timeframe in 1986 which we think we will make an improvement.

Senator EXON. Thank you. That is very good.

Under a nonstress environment today we are in communication with what percentage of our submarines at sea? You said earlier that moving from one place to another down [deleted]. But the rest of them that are actually in an operational mode on assignment, are we in constant communication with them [deleted] percent, [deleted] percent of the time?

Admiral NAGLER. The FBM submarines that are on station and in an alert mode, carrying out their leg of the Triad, we are in communication [deleted] percent of the time day in and day out.

The submarines that are mod-alert, like the Chairman mentioned earlier, who are out in training, FBM submarine in training or who are enroute to a station to relieve a submarine that is on alert, we communicate with them [deleted].

When ELF comes along we will be in constant communications with those submarines on mod-alert.

[The prepared statement of Admiral Nagler follows:]

PREPARED STATEMENT OF VICE ADM. GORDON R. NAGLER, U.S. NAVY DIRECTOR, COMMAND AND CONTROL

Mr. Chairman, I am pleased to have this opportunity to again discuss the Navy's strategic command, control and communications program. I will attempt to provide you with a broad perspective of how our program relates to improving the survivability and endurance required for effective C^3 support of Navy sea based strategic weapon systems.

The past year has been continued high level of attention on improvement of strategic C^3 capabilities. This major initiative, which had its impetus in the President's strategic modernization program, was supported by Congress during the fiscal year 1983 budget process. As a result, we have made significant progress in furthering the initiative which derived from this administration's review of strategic connectivity. Major Navy strategic C^3 programs were adequately accommodated in the current budget submission to Congress and have been forcefully and succintly supported by the top echelons of the Navy.

CURRENT ASSESSMENT

The U.S. Navy continued to have the finest peacetime and crisis management command and control system in the free world. We have the capability to exchange the critical command instructions with the Navy and Marine Corps teamed wherever they may be, such as Beirut, Lebanon, almost simultaneously. With a smooth operating, highly flexible peacetime capability, our primary emphasis within the strategic programs has been to achieve increased survivability and endurance through electromagnetic pulse hardening, mobility and redundancy of systems using the most cost effective approach.

NEW REQUIREMENTS

As the balance of nuclear capability has shifted to our disadvantage, the importance of effective strategic force management through surviving and enduring command and control has markedly increased in importance.

Of the three major areas in strategic warfighting C^3 (that is, threat warning/attack assessment, command and control information systems, and message delivery systems), Navy's responsibilities encompass only message delivery systems. These systems require a high degree of reliability during extreme conditions of enemy jamming or nuclear effects. Redundant communication systems are required for the delivery of preformated emergency action messages to submarines with the ultimate in survival capability. Message transmission times increase during periods of high stress to the environment necessitating multiple links with redundant communication nodes. The enemy currently has the capability to [deleted].

FISCAL YEAR 1984 PROGRAM

Navy's 1984 budget continues maximum support of this goal. Major programs of importance include: continued operation and improved capabilities for the current TACAMO airborne VLF relay system include [deleted] continued development to attain a more capable replacement airframe (ECX) to adequately perform the TACAMO mission of the future; successful participation in joint development work for an extremely high frequency (EHF) military strategic tactical and relay (MILSTAR) satellite communication system with [deleted] characteristics; full support for the extremely low frequency communications system approved by the President and Congress; research and development of reconstitutable communication concepts; and initiatives to provide more effective and survivable C^3 to battle group commanders at sea [deleted]. I shall highlight the key aspects and status for each of these major initiatives.

EXTREMELY LOW FREQUENCY (ELF)

Extremely low frequency is a communications system that provides a unique capability to submarines because of the ability of ELF signals to penetrate sea water to hundreds of feet. ELF enhances the credibility of our sea-based nuclear deterrent forces by protecting their assured survivability, reducing detectability of near surface observables (magnetic, wake, visual, and other non-acoustics), and increasing operational flexibility. ELF will provide insurance against a Soviet anti-submarine warfare breakthrough.

With ELF, submarines can continuously operate at optimum patrol speeds and depths while retaining continuous receiving connectivity. ELF can be used to order submarines to establish higher data rate communications (very low frequency, low frequency, high frequency, or satellite). Absence of ELF signals can also cause a shift to higher capability communications. A three-character, preformatted ELF message will normally require between [deleted] for receipt, depending on the SSBN operating areas.

U.S.S. *Ohio* (SSBN 726) had an experimental ELF receiver installed for her first patrol in 1982. [Deleted.] Five other submarines have ELF experimental receivers installed.

The existing 28-mile, overhead antenna at the Wisconsin transmitter facility [WTF] will not be expanded. The WTF transmitter and associated equipment were developed in 1969 for testing purposes and are being upgraded to meet transmission performance specifications required for an operational system. A second ELF transmitter and 56-miles of overhead antenna will be built in Michigan, near K. I. Sawyer Air Force Base, in support of the Presidential decision to

deploy an ELF system with an initial operational capability of fiscal year 1985, full operational capability of fiscal year 1987.

The Navy is confident that there will be no adverse effects on area residents from the operation of the ELF system; the National Academy of Sciences in 1977 stated that concerns about dangerous contaminations from ELF fields were invalid and unwarranted. Nevertheless, acknowledging public concern, the Navy has initiated an ELF ecological monitoring program to assess whether electromagnetic fields associated with ELF antennas and ground terminals could possibly produce biologic effects over a long period of time. During 1982–83 the Navy coordinated with Wisconsin and Michigan State officials in developing this monitoring program. Additionally, numerous Navy meetings were held with these States' Department of Natural Resources and the U.S. Forest Service representatives to ensure local concerns were taken into consideration in planning for the operational ELF system. The Navy will comply with applicable State and Federal laws, rules, and regulations pertaining to environmental protection in proceeding with the development of the ELF system.

In 1982 the Navy initiated a yearly certification program to insure occupational safety, high quality of service, and interference-free service to public utility customers. The 1982 certification program showed that public utilities near the WTF Clam Lake, Wisconsin, ELF facility are indeed safe and interference free. A February 1983 technical report prepared for the Navy by IIT Research Institute documented electromagnetic field intensities in the vicinity of Clam Lake, Wisconsin, produced at 76 Hz by ELF communications antennas, and at 60 Hz by commercial power systems. All measured electromagnetic field measurements verified that, except within a mile of the ELF antennas, fields produced at 76 Hz are substantially lower than fields produced at 60 Hz by commercial power distribution systems. All measured fields are well below that level which would be of concern to humans or the environment.

The ELF program 1984 budget request is $58.5M RDT&E and $13.0M for construction. These funds will continue full-scale development of the ELF system including: Operation and testing at the existing Wisconsin facility, environmental and safety research development, submarine receiving system design and prototype fabrication, improved shore based transmitters and associated equipment, and the construction of the Michigan transmitter site including the antenna lines.

SURVIVABLE AND ENDURING C^3

The Navy technological alternatives working groups examined the recommendations concerning development of strategic communications and related technology. Recommendations concerning research and development were suggested in a number of areas. For example: Antenna support systems, recommended that R&D be directed toward providing a rapid deployment capability for [deleted] suitable for use in mobile systems. The Navy technological assessment concluded that there were a number of feasible systems ready for engineering development that would improve strategic C^3 [deleted]. For example: [deleted] TACAMO improvements and airframe upgrades were considered the clear choice due to data rate, cost, and operational flexibility considerations. [Deleted] transportable ELF and mobile VLF were considered ready for engineering development. Mobile VLF was considered clearly superior to transportable ELF from the viewpoints of operational utility and cost. This year's budget requests $4.7M of RDT&E to proceed into full-scale engineering development of reconstitutable/mobile VLF.

TACAMO

TACAMO is the primary survivable dedicated Navy relay communications system to the submarine missile forces. The current level of 15 aircraft provides the capability for maintaining an aircrafft continuously airborne in the Atlantic [deleted]. Three additional aircraft will be delivered this calendar year [deleted] to fulfill the continuing JCS requirement for continuous airborne coverage [deleted] in both the Atlantic and the Pacific to support two-ocean missile deterrent patrols. Two additional aircraft with [deleted] will be delivered in 1985 to assist in the transition to a new airframe.

The EC–130 now performing the TACAMO mission has a significant number of deficiencies which degrade its capability to perform and reduce the probability of [deleted]. These deficiencies include: insufficient aircraft speed, endurance

and force level numbers to satisfy the [deleted]. In addition, nine EC–130's reach the end of their extended service life in 1986–1989.

The 1984 submission requests $63.0M to: support the operation of the current system; add [deleted] to the newest EC–130's; and upgrade the current communications suite to remain compatible with the rest of the minimum essential emergency communication network (MEECN). The Navy's study of alternative for upgrading the TACAMO communications suite, requested by the 1983 authorization conference, has been completed and will be sent to Congress this month by the Under Secretary of Defense for research and engineering.

ECX

To exploit the increased operational capabilities of the sea-based strategic missile system with the introduction of the Trident weapon system, the mission requirements of the TACAMO airborne communications system have expanded beyond the capabilities of the EC–130 airframe. We need to help the fleet with today's problems instead of just talking about the future. In order to overcome the deficiencies of the EC–130 and perform the TACAMO mission of the future, a new aircraft, designated the ECX, is required having increased range and endurance, growth potential, [deleted] airborne refueling, and increased speed. Furthermore, the improved reliability and maintainability of a modern airframe will result in an aircraft which is less expensive to own and operate from the standpoint of life cycle costs. A fleet of 29 EC–130's at a life cycle cost of $4.2B (fiscal year 1981 dollars) would be required to inadequately perform the TACAMO mission of the 1990's; whereas, only 15 ECX at a life cycle cost of $3.8B can provide a significantly more survivable link which is as endurable [deleted].

The request for best and final offer for the ECX program is currently at the contractor and the definitized contract is expected to be signed by the end of April. The fiscal year 1984 budget requests $107.7M for ECX procurement. This is the top priority Navy strategic C^3 initiative and one of the CNO's top priority programs.

EHF SATCOM

The new military strategic, tactical and relay satellite (Milstar) Strategic system, a DOD joint program under USAF leadership, will provide extremely high frequency (EHF) satellite communications for all DOD strategic and tactical users. This system is the outgrowth of DOD initiatives to develop and implement (a highly [deleted] satellite communications system possessing strong survivability attributes).

It is based on previous advanced development work which demonstrated that EHF frequencies offered characteristics that make this choice of frequencies highly desirable for military use. (For example, the wide bandwidth available permitted processing techniques necessary to [deleted].)

MILITARY STRATEGIC, TACTICAL AND RELAY SATELLITE (MILSTAR)

The above cited advantages are not known to be available in any other communications system and offer the [deleted] opportunity to improve our command and control posture with a [deleted] capable system. (Based on this, a military satellite communications system architecture was developed to insure a coordinated approach in fielding a satellite communications system. A key element in this new architecture is the Milstar spacecraft, EHF terminals and associated equipments.) A streamlined management system has been established, staffed, and is comprised of a joint Milstar program office located at U.S. Air Force space division and principal component offices for system engineering; spacecraft development and acquisition, also in Los Angeles; and the joint terminal program office, located in Washington, D.C., under Navy leadership.

As defined, the system consists of [deleted]. Under Air Force space division contractor spacecraft development proposals have been evaluated and a contractor selected. Negotiations for spacecraft development are now ongoing.

Research work on Army and Air Force terminal development is at an advanced stage and the Navy is now in its second year of full scale development. Contracts have been awarded for production of 12 engineering developmental model terminals for Navy applications. Two submarines, three surface ships, and one shore terminal will be produced by each of two contractors and competitively evaluated in technical and operational testing in 1986. This program will establish

the basis to award a follow-on production contract. To complete this evaluation, an EHF space segment applique package is under development at Lincoln Labs for integration and flight on FLT Satcom satellites No. 7 and No. 8. This package, funded by the Navy is under acquisition authority of the joint Milstar program office to ensure its development is supportive of the Milstar space segment. In addition to fulfilling technical and operational evaluation requirements, the EHF space segment applique packages will reduce technical, schedule and cost risks in Milstar satellite development. [Deleted.]

[Deleted.]

SUMMARY

In summary, current C^3 connectivity to Navy strategic forces is being met in the pre-attack or deterrent phase of conflict with [deleted]. The Navy TACAMO system and Milstar satellites. Initiatives in this budget which: Fully support the ELF communications system upgrade the capabilities of the current TACAMO fleet to include [deleted]; continue the development of a more capable follow-on ECX airframe improve connectivity to TACAMO and other strategic forces through EHF Satcom, and enhance communications effectiveness will improve the survivability and endurance of the Navy strategic C^3 capability [deleted].

Mr. Chairman, I would now be pleased to answer questions on this program.

Senator EXON. Thank you.

Gentlemen, in your brief statement you said something about hardening. I thought you said both hardening of MILSTAR for both laser and nuclear attack.

Did I understand you correctly.

General RANDOLPH. That is correct. What the threat predictions show is that the Soviets today are working on laser weaponry, potentially ground-based laser antisatellite weapons and in the future possibly even space-based antisatellite weapons.

The initial laser hardening that we propose for MILSTAR is directed toward that ground-based threat. If in fact the space-based threat develops in the future, then future upgrades of MILSTAR will take that hardening into account.

Senator EXON. I am delighted with the news because I think many of us have been worried about what the Soviets are doing in space and that they would be able to knock out key communications and surveillance that we have up there in which MILSTAR will obviously play a key role.

From what you know of the program now you are convinced that we can harden, if you will, MILSTAR to have a relative degree of safety from both laser and nuclear attack by the Soviets?

General RANDOLPH. Yes, sir, in fact we are in the process of designing the satellite to do exactly that.

Senator. I might point out that we have had now for some years in the Air Force materials lab a rather extensive program which examines the kind of techniques that one might apply to laser hardening of special materials, special techniques that we might use in order to negate the kind of destructive force that a high energy laser might try to deposit on a spacecraft.

We are now applying that technology to the MILSTAR program.

Senator EXON. Are we also applying this technology then to our other satellites or will we be doing it?

General RANDOLPH. Yes, sir, absolutely. [Deleted.]

So, we have already started doing that with other satellites.

Mr. LATHAM. [Deleted.]

Admiral NAGLER. Since its launch 5 years ago.

Senator EXON. Do the Soviets have anything that comes close to this hardening technique that we are working on and have in operation?

Mr. LATHAM. [Deleted.]

So, that type of technology is the beginning of hardening against a weapon's type effect. [Deleted.]

Senator EXON. Thank you, gentlemen.

Thank you, Mr. Chairman.

Senator WARNER. Thank you, Senator, for that helpful participation.

Gentlemen, I feel that we will submit the balance of our questions for the record. If you can get them back as soon as possible. Is that a fair trade-off?

General RANDOLPH. I might add one thing as a followup to Senator Exon's discussion about the survivability of our space systems. One of the things that we are doing is working on ways to improve the survivability of all the space systems that support the war fighting forces.

That is an active ongoing program in the Air Force today. Of course, since the Air Force is responsible for funding about 80 percent of the strategic C^3 improvements that are ongoing now, we are very cognizant of our role there. We are sensitive to making sure that those systems are survivable and can support the war fighting forces.

Senator WARNER. Thank you very much and thanks to your backup assistance today and to our reporter.

Mr. LATHAM. Thank you very much, Mr. Chairman.

[Questions submitted by Strategic and Theater Nuclear Forces Subcommittee members to be answered for the record follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN WARNER

COMMAND AND CONTROL FOR CLOSELY-SPACED BASING

Senator WARNER. Have you participated in the evolution of the requisite command, control, and communications systems for a closely-spaced basing deployment for the MX?

Mr. LATHAM. I have been briefed by the Air Force on the operational concepts and general technical requirements for the C^3 associated with Peacekeeper in a closely-spaced basing mode. Members of my staff have attended program reviews and the Air Force Scientific Advisory Board review of MX C^3. They also participated in the deliberations of the Task Force chaired by Dr. Townes, which examined the closely-spaced basing for Peacekeeper.

Senator WARNER. Are there such uncertainties and technical difficulties in designing and fielding a C^3 system for a CSB/MX deployment as to cause you to believe that the closely-spaced basing system proposed by the President last fall could not be made workable?

Mr. LATHAM. No. Admittedly the severe environment which a deliberate attack on a closely-spaced base would create would present some unique electromagnetic and physical survivability problems, but none that would cause me to think a solution could not be engineered using developments based on presently available technology. The key challenge is the battle management system for C^3 once the Soviet attack is underway.

BMD BATTLE MANAGEMENT

Senator WARNER. Has your office been intimately involved with the definition and development of comand and control systems needed to provide credible battle management capability for any Ballistic Missile Defense system we might wish to deploy?

Mr. LATHAM. Yes. I have two members of my staff who have been very much involved in this effort. They interface on a continuing basis with the BMD per-

sonnel at Huntsville, Alabama, attend the in-process reviews (IPRs) at the C³ Contractor's plant and are members of BMD C³ working group that was recently formed by the BMD Program Office. However, there are many extremely difficult technical problems to solve for an enduring C³ system in support of BMD.

DSP CROSS-LINKING

Senator WARNER. How much importance do you attach to the provision of crosslinking capability between key C³ network assets such as the Defense Support Program (DSP) spacecraft? How far along on incorporating that capability are we?

Mr. LATHAM. [Deleted.]

E–4B PROCUREMENT

Senator WARNER. What changes in your mission requirements have been identified which have justified the elimination of E–4 aircraft numbers 5, 6 and 7 from your Five-Year Defense Plan?

Mr. LATHAM. The procurement of additional E–4 aircraft was required so that the E–4 could support both the National Emergency Airborne Command Post mission and the CINCSAC Airborne Command Post mission. [Deleted.] Based on this rationale, action to procure additional E–4Bs to support CINCSAC was terminated.

Senator WARNER. Have you reviewed contractor data which supports the requirement for additional buys on the grounds of the necessity of maintaining an alert aircraft capability which cannot be met with the current four aircraft? What is your view of this data?

Mr. LATHAM. I have reviewed the contractor data that you are referring to. It has been very useful in that it points out that the E–4B possesses an inherent capability to operate for long periods without external support and that random basing significantly improves survivability. We are not prepared to agree that a four aircraft fleet cannot support an acceptable alert posture, but the issue is not closed. The capability provided by a single element of our command, control and communications structure must be viewed in the context of its contribution to the overall mission so that only the most logical and cost-effective initiatives are pursued. The need for additional E–4B aircraft is being assessed within our ongoing development of an integrated command, control and communications architecture.

MODERNIZATION OF THE PACCS FLEET

Senator WARNER. Last year, you were asked about the plans for modernizing the Post Attack Command and Control System (PACCS) aircraft.

What progress has been made in defining the requirements for a modernized PACCS fleet and what steps have been taken to provide the requisite funding for such a program.

Mr. LATHAM. In response to a request from your committee, we prepared a report on our plans to modernize the Worldwide Airborne Command Post fleet (to include the Post Attack Command and Control System aircraft). A copy of this report was forwarded to Senator Tower on November 15, 1982. This report provides detailed information on what we feel must be done to these aircraft and their command, control and communications (C³) systems to ensure that they can continue to function given changing threats and a constantly evolving C³ environment. Providing adequate funding to support this effort was a key issue during the development of the fiscal year 1984 DOD budget. Adequate funding was identified and is included in the 1984 President's Budget.

Senator WARNER. How urgent do you believe the replacement of aging PACCS airplanes to be?

Mr. LATHAM. Ongoing life-extension modifications to the EC–135 airframe will extend its useful life beyond the year 2000. The more critical factors are the performance characteristics of the EC–135 and its space and weight limitations. It currently appears that the replacement of certain aging systems with new miniaturized equipment plus the rearrangement of some equipment can minimize the weight and space constraints of the EC–135. Aircraft performance is a more complex issue, in that, what is desired is an aircraft capable of short takeoffs and landings and one that can support autonomous operation from austere airfields. These characteristics are not currently provided by the EC–135. Although we may need to replace the EC–135 at some time in the future, current efforts to improve

the survivability of existing systems, deploy additional redundant systems and proliferate command, control and communications capabilities are considered to be of a higher priority.

RELOCATING THE E–4B

Senaor WARNER. Last year, as you know, this committee took an initiative whereby in the fiscal year 1983 Defense authorization bill as enacted by the Senate, the administration was directed to relocate the E–4 "Kneecap" aircraft from Andrews Air Force Base to a point in the interior of the United States.

While this statutory requirement w's not accepted by the House/Senate Conference, I understand that the administration is pursuing steps along these lines.

Can you give us an update on the situation with respect to relocating the E–4. How urgent a priority do you believe such a relocation could be?

Mr. LATHAM. At the request of the administration, a plan to relocate The National Emergency Airborne Command Post was developed and has been submitted for approval. [Deleted.]

DSP GROUND STATION CONNECTIVITY TO NORAD

Senator WARNER. What are the current means of providing connectivity between the DSP Ground Station and the NORAD facility at Cheyenne Mountain?

Mr. LATHAM. Currently, the data from [deleted]. The data is then sent directly to NORAD and the other users via [deleted].

Senator WARNER. What is the likelihood that this means of connectivity will survive an EMP-type attack?

Mr. LATHAM. [Deleted.] However, these phenomenon are so complex to predict that it is entirely possible that a significant portion of the commercial system could in fact function after an EMP attack.

Senator WARNER. What initiatives are planned to provide a high-confidence connectivity capability for this critical function?

Mr. LATHAM. Two programs are ongoing and another is programed to provide a high-confidence connectivity among the [deleted].

PRIORITIES IN EMP HARDENING

Senator WARNER. Mr. Latham, do you believe that, given the inherent difficulties in providing assured EMP hardness to fixed ground-based facilities, we are better advised to pursue aggressively a hardening of airborne assets and other elements of the C^3 system rather than expanding large sums to EMP harden the land-based portion of the C^3 network?

Mr. LATHAM. It is not difficult to provide assured EMP hardness for a limited number of selected ground-based C^3 facilities. It is easier and costs less to EMP harden a ground-based C^3 capability, as has been done at HQ SAC and NORAD [deleted] as examples, than to harden an equivalent airborne asset. While this approach provides a hardened command post capability, the communications links connecting the hardened command posts to the users have limited range. In order to have an end-to-end hardened communications capability, a Groundwave Emergency Network (GWEN) type system, hardened satellites, or hardened airborne platforms must be used for relay. EMP hardening of airborne assets with high confidence is a more complex and potentially more expensive task. This is primarily due to the weight, space and the flying environment constraints imposed on the hardening approach that has to be implemented. However, because of mobility and location uncertainty, airborne assets have a significant survivability advantage over fixed ground facilities to sabotage and nuclear effects.

There is an element of the land-based C^3 system, [deleted]. This approach may have merit depending on its cost and available assets.

Under these circumstances, [deleted].

REVISIONS OF ELECTRO-MAGNETIC PULSE THREAT

Senator WARNER. Are steps currently underway to revise the assessment of the threat posed to the U.S. strategic C^3 network by electromagnetic pulse effects of nuclear weapons? Does it appear that the threat levels assumed previously are proving to be less than expectant?

Mr. LATHAM. Steps are underway to both review and update the EMP threat [deleted]. DNA is presently conducting R&D to quantify energy content at [deleted] should not present a problem to EMP hardened facilities and its effect on unhardened ground-based facilities will probably be within the uncertainty associated with EMP effects on these facilities.

Senator WARNER. Is the resiliency of our C³ system to EMP effects proving to be greater than previously believed?

Mr. LATHAM. The resiliency of our overall C³ system to EMP is [deleted].

MOBILE COMMAND CENTER OPTION

Senator WARNER. Have studies been performed with respect to alternatives available to us for providing survivable, mobile command and control centers? In your view, do shipborne MCC's provide greater survivability and operational flexibility than do ground-based mobile command?

Mr. LATHAM. The question of the optimum platform mix that will provide a survivable and enduring node of the NMCS is currently under study by a DOD strategic command center panel. This panel has been given the responsibility to define the concept and generic structure for coherent, interoperable and endurable strategic command center capability for use by senior decision makers such as the JCS and the nuclear-capable CINCs. The panel has also been tasked for the integration of existing and near-term planned command centers and will design a mid- and long-term strategic and theater nuc ear command center architecture for the DOD. The results of their effort should be available in late summer.

The use of land-mobile assets to exploit mobility as a basis for reducing C³I vulnerability [deleted]. On the other hand, small coastal merchant type ships can operate autonomously in off-shore areas re atively free from collateral damage effects and can support larger staffs, facilities and communications antennas than can be accommodated in practical land-mobile configurations.

The shipborne MCC could provide an alternative means of achieving continuity of force management, intelligence collection and processing, and decision-making support throughout a protracted strategic conflict. The survivability of the shipborne MCC would be a function of [deleted].

There are advantages and disadvantages between land-mobile assets and shipborne MCC's with regard to survivability and endurability. Cost, connectivity and vulnerability are major factors to be considered. The best chance of surviving and enduring the NMCS lies in a combination of surface, sea and air command center facilities.

THREAT ASSESSMENT CONFERENCING

Senator WARNER. Is it true that our current threat assessment conferencing capability requires the use of leased, non-secure, and vulnerable landlines? Is there no backup to this capability?

Mr. LATHAM. The current threat assessment conferencing capability uses a [deleted]. In addition, we are in the process of transferring critical circuits and networks from commercial microwave and satellite facilities to government-owned, hardened facilities.

Senator WARNER. What would be the effects for the National Command Authority decisionmaking process if the capability should be denied?

Mr. LATHAM. The denial of threat assessment conferencing could possibly delay or interrupt critical conferencing timeliness. However, the likelihood of this occurring is slim. If the United States has strategic warning and reacts to this warning, then the NCA, connected through NEACP or a Mobile Command Center, can conduct the critical conferencing required via DSCS and in the late 1980's, via MILSTAR or GWEN.

Senator WARNER. What steps are planned in the present C³ modernization program to rectify the deficiencies of this system?

Mr. LATHAM. The requirement to rectify the deficiencies of the system has been validated, and preparatory steps have been taken regarding a concept for developing, fielding and funding for equipment to satisfy the requirement. A secure conferencing project (SCP) has been established that will provide for the development of enhanced strategic command and control, and general purpose conferencing capabilities using Jam Resistant Secure Communications terminals,

satellite connectivity and cryptographic equipment that is hardened against EMP. An early operational capability is planned for fiscal year [deleted] and will include many users [deleted]. A [deleted] conferencing capability that will include [deleted] locations is planned by the fiscal year [deleted] timeframe.

EMBEDDED COMPUTER SYSTEMS STANDARDIZATION

Senator WARNER. Secretary Latham: Would you describe the status of the review being performed pursuant to congressional action last year concerning embedded computer systems standardization? Please provide in detail the options under review and their relative merits and deficiencies.

Mr. LATHAM. The study directed by Congress as a part of the fiscal year 1983 Defense Authorization Act has been underway since November 1982. It is being conducted by a team from the three Military Departments and the OSD staff. A rough draft report has been prepared and the target for completion is April 15, 1983.

The study is addressing the six issues posed in the Conference Report, namely:

(a) A full assessment of the applicability of commercial computer technology including, but not limited to computer hardware, semiconductors and associated ISA's to Defense Department missions.

(b) The desirability of standardization at ISA level in light of alternative approaches, including those taking advantage of the technology mentioned in paragraph (a).

(c) The degree of software transportability (transferring computer programs from one computer to another) that the various approaches permit and how each approach would affect Department of Defense hardware/software logistics support requirements and the cost of computer system ownership.

(d) An assessment of the relative merits and liabilities involved in the incorporation of each approach into Department of Defense weapons systems.

(e) A justification for all on-going service computer development projects including but not liimted to the Army's Military Computer Family and other Army computers, the Navy's AN/UYK–43/44, the AN/UYK–7, the AN/UYK–20 and all Air Force computers including the family military-standard 1750 ISA computers.

(f) A plan to reduce the proliferation of these computers.

Among the options under review are: No standardization; Standardization only at the High Order Language (HOL) level; standardization at the Instruction Set Architecture (ISA) level; standardization on a limited number of external attributes; form, fit and function (F-cubed) standardization; box-level hardware standardization; module-level standardization; and total product standardization.

The relative merits and deficiencies of these approaches and various combinations of them will be included in the report which will be delivered to the Congress. It is not possible to provide the detail you request in advance of completion of the study.

STREAMLINING MISSION-CRITICAL COMPUTER PROCUREMENTS

Senator WARNER. Secretary Latham: Would you describe for the record progress which has been made in the aftermath of the committee's initiative concerning the streamlining of critical mission related computer procurements? What steps have been taken to implement this initiative?

Mr. LATHAM. In February 1981, the Department issued preliminary guidelines which informed the acquiring activities in the Department of the change in our authority relative to computer acquisition. Particular note was made that the essential test as to whether such acquisitions were to be under 10 U.S.C. 2315 or 40 U.S.C. 759 is the functional usage of the equipment and services, and not their commercial marketplace availability. The Under Secretary of Defense for Research and Engineering was named the senior official in the context of Section 2315.

Language in the committee's report on the fiscal year 1983 Defense Authorization Act clarified the intent of Congress with respect to this exemption. With that clarification and in coordination with the Office of Management and Budget, the guidelines were revised and reissued on March 4, 1983. A copy of the revised guidelines has been provided to the Committee. At that time, the Under Secretary of Defense for Research and Engineering delegated the responsibilities of Senior

Official for Mission Critical Computer Resources (MCCR) to the Deputy Under Secretary of Defense for Research and Advanced Technology. He further directed that a Defense Computer Resources Board be established under the MCCR Senior Official. This Board will serve in policy oversight role for determinations of exempt status under 10 USC 2315. This latter action will be implemented as part of a current update to DOD Directive 5000.29, "Management of Computer Resources in Major Defense Systems."

ECX/TACAMO

Senator WARNER. Would you comment at this time briefly, and in greater detail for the record, on the reasons for which the Navy found unacceptable the unsolicited proposal submitted by the Lockheed Corporation which called for the cancellation of the ECX program and the procurement instead of modified EC–130 aircraft.

Admiral NAGLER. On March 11, 1982, the Naval Air Systems Command issued a Request for Quotation (RFQ), No. N00019–82–Q–0014, expressly to obtain an ECX Weapon System. The ECX Weapon System, as defined by the RFQ, is an electromagnetic pulse hardened aircraft serving as a platform for the AN/USC–13 mission Airborne Very Low Frequency Communication System. Both the aircraft and the communications system comprise the ECX Weapon System. The RFQ permitted an offerer to submit deviations from the type specifications as long as reasons for the deviations were included in the quote. Lockheed did not respond to the RFQ. On 30 June 1982, Lockheed submitted an unsolicited proposal to CNO for a preplanned product improvement to the EC–130. On 9 August 1982, the Lockheed proposal, with a covering letter from the Chief of the Naval Material Command, was returned to the President of the Georgia-Lockheed Company, explaining that it did not meet the criteria of an unsolicited proposal as delineated in the Defense Acquisition Regulations (DAR) and other applicable Naval instructions. The Lockheed proposal was submitted as "unsolicited," but section 4–904 of the DAR defines an unsolicited proposal as a "written offer to perform a proposed task or effort, initiated and submitted to the Government by a prospective contractor (offerer) without a solicitation by the Government, with the objective of obtaining a contract." In addition, Naval Air Systems Command Instruction 4200.8B provides that a proposal shall not be deemed "unsolicited" when it (1) is merely a normal development or extension of an existing Department of Defense Program, or (2) the designation "unsolicited proposal" is applied for the apparent purpose of avoiding competition. The proposal submitted by Lockheed addressed the Government's requirement delineated in the RFQ and, thus, the Department of the Navy cannot treat the proposal as "unsolicited." The Government cannot consider a proposal for a requirement separately, when that requirement is the subject of an ongoing competition. Consideration of the proposal would be unfair to the companies who responded to the solicitation and would greatly jeopardize the integrity of the competitive process.

Additionally, an operational assessment of this proposal by the Office of the Chief of Naval Operations revealed numerous discrepancies, errors and unsupported assumptions thus avoiding the unsolicited proposals conclusions.

Senator WARNER. Are you concerned that it may prove to be impossible to support the [deleted] airborne alert posture in the Atlantic until such time as the new ECX aircraft is introduced into the inventory?

Admiral NAGLER. I fully expect TACAMO to continue its outstanding performance in the Atlantic throughout the transition to ECX. The Atlantic TACAMO squadron began supporting the JCS 100 percent airborne mission in September 1973. Since 1973 there has been [deleted] continuous Atlantic coverage. There will be no more severe conditions during the upcoming transition period than there have been in the past.

Senator WARNER. Operational commanders have indicated concerns along these lines. What steps are planned by the Navy to alleviate this problem?

Admiral NAGLER. The OPNAV staff along with the Naval Air Systems Command have arranged a schedule for depot level maintenance [deleted]. This is an acceptable level that can be supported by each squadron without jeopardizing the mission. The Fleet CINCS have personally agreed to this plan.

Senator WARNER. Would a further buy of EC–130 aircraft to insure an ability to support uninterrupted coverage in the Atlantic over the next few years be advisable?

Admiral NAGLER. Purchase of additional performance, weight, speed and range limited EC–130s and companion communication suites would not see delivery until 1987 and would be too late to be of any assistance in the transition from EC–130 to ECX.

EXTREMELY LOW FREQUENCY (ELF)

Senator WARNER. You testified that the ELF system was performing according to mathematical predictions of its capability. Isn't it the case that the deployment sites selected have actually been shown to be capable of projecting an ELF transmitted message over a substantially greater area than had previously been thought possible with a system this size?

Admiral NAGLER. Extremely Low Frequency (ELF) system performance has been predicted on a worst case basis for [deleted] time availability throughout the required submarine operating areas. This performance is based on a submarine at a keel depth [deleted] and a speed [deleted]. Changes in depth, speed, range, and atmospheric noise which create excess signal strength provide added oprational flexibility to extend heading capabilities or expand receiving envelope factors. In such cases, ELF messages have indeed been received in areas outside the mathematically predicted, "worst case" area of reception contours. U.S.S. *Ohio* (SSBN 726) had an experimental ELF receiver installed for her first Trident patrol in 1982. ELF reception occurred [deleted] percent of the time irrespective of the ship's heading. [Deleted] ELF messages were received [deleted] and this with only a partial ELF transmitting capability in operation.

CUBAN JAMMER SYSTEM

Senator WARNER. How long has there been a jammer based on Cuban soil? What do we know about its capabilities? Is it currently interfering with any of our C^3 activities?

Admiral TOMB. [Deleted.]

EMP HARDNESS OF ANMCC ANTENNAS

Senator WARNER. What percentage of the Alternate National Military Command Center's Antennas would we expect to lose as a result of EMP effects? Are steps planned to rectify this deficiency?

Admiral TOMB. [Deleted.]

SOVIET SPACE MINES

Senator WARNER. What can you tell the committee about Soviet capabilities with respect to space mines as a means of threatening our critical space-based C^3 assets?

Admiral TOMB. The deployment of a space mine is certainly within Soviet technological capabilities. [Deleted.]

Senator WARNER. Is it believed that the Soviet Union possesses today the necessary technology? Do you personally feel that such a space mine anti-satellite capability exists in the Soviet inventory/is deployed in orbit?

Admiral TOMB. The Soviets have the necessary technology to employ a space mine. [Deleted.]

OPERATIONAL IMPROVEMENTS

Senator WARNER. What steps are planned to try to make the evacuation of the President [deleted] system in the event of an attack more efficient, and consequently, more likely to succeed in its mission of insuring the survivability of the National Command Authority?

Admiral TOMB. [Deleted.]

ELECTROMAGNETIC PULSE

Senator WARNER. What would be involved in the Soviet Union acquiring a capability? Are they believed to have such a capability today? Would we expect to have any high-confidence indicators that such a capability has, in fact, been deployed in the Soviet arsenal?

Admiral TOMB. [Deleted.]

PAVE PAWS EMP HARDNESS

Senator WARNER. How hard against EMP effects is the PAVE PAWS radar system?

General RANDOLPH. [Deleted.]

Senator WARNER. In the event that these radars are shut down due to power failure as a result of EMP effects, would they be brought back on-line by an emergency standby power system? How long would it take before the system was returned to operation under such circumstances?

General RANDOLPH. If the system were at an [deleted].

If we were not on backup power, and a commercial power outage were to occur for any reason, [deleted].

MILSTAR TECHNICAL PROBLEMS WITH CONFERENCING CAPABILITY

Senator WARNER. General Randolph, I understand that problems have developed of a technical nature with respect to the conference system planned for the MILSTAR satellite. Is there indeed such a problem?

Have the sources of this problem been identified and when do you anticipate corrective action will be taken to rectify these problems?

General RANDOLPH. As can best be determined by the MILSTAR Joint Program Office and Joint Terminal Program Office, no technical problems exist in the conferencing system planned for MILSTAR. All MILSTAR terminals will use common secure voice equipment, the Advanced Narrow-band Digital Voice Terminal (ANDVT). This will insure that full cross service compatibility is achieved.

MILSTAR PRIORITY

Senator WARNER. In years past, the Committee has sought assurances that the MILSTAR program remains a high priority and enjoys unflagging support of its various prospective users. Would the panel speak to this question both in terms of its support for the revised MILSTAR schedule and the priority each panel member assigns to the funding and deployment of this highly costly system?

General RANDOLPH. MILSTAR enjoys a high degree of visibility and support. To date, most of the funds requested for MILSTAR have been approved. Furthermore, the Secretary of Defense recently accorded MILSTAR the highest priority ever given to a C³I program. Formerly this priority was reserved for high visibility weapons programs such as the MX, Trident submarine, B–1 bomber, and the cruise missile program. The revised schedule has not changed this priority. MILSTAR remains the highest priority C³I program.

QUESTIONS SUBMITTED BY SENATOR STROM THURMOND

EMP AND C³ CAPABILITIES

Senator THURMOND. Mr. Latham, currently in the press, there has been a great deal of discussion of the effects of electromagnetic pulse. This phenomenon can have disastrous effects on C³ capabilities. Would you assess for the Committee our present vulnerability to electromagnetic pulse?

Mr. LATHAM. A large percentage of our critical communications systems are dependent on the leased telephone circuits. The leased telephone system is not hardened to electromagnetic pulse (EMP). A large analysis and test effort was conducted by various DOD agencies to assess the EMP vulnerability of the leased telephone during the 1970's. The basic conclusion that came out of these efforts is that the EMP vulnerability of the leased telephone system is [deleted]. DNA recommends that we (1) use what is remaining of the existing system (if we can); (2) where serious vulnerabilities can be readily identified, consider fixing them; and, (3) identify and provide high confidence (unarguably survivable) overlay systems which contain proliferated nodes, each hardened to EMP, connected by links that are immune to nuclear weapons effects—such as the Ground-wave Emergency Network (GWEN) or other hardened systems.

Today, in the CONUS, we have a very limited number of [deleted]. MILSTAR is another example.

For local area communication, EMP hardening is considerably simpler and, in many cases, can be accomplished by command initiative. [Deleted.]

The EMP vulnerability of aircraft, including helicopter systems, [deleted].

Studies that have been conducted by DOD agencies and the Federal Emergency Management Agency (FEMA) to predict failures in the national power grid due to EMP. The extent of these failures is not well understood. [Deleted.]

In summary, there are demonstrated vulnerabilities associated with C³, aircraft and power systems. Without specific evaluation and sometimes testing of systems involved, it is only possible to address these issues in a general way. For any mission analysis, it is necessary to consider the EMP vulnerabilities of all the systems involved in mission performance, as well as systems that may indirectly affect mission performance (that is, aircraft, power systems, etc.).

MX BASING

Senator THURMOND. There is a great deal of doubt as to whether the President's MX plan will survive. How much of the money in the fiscal year 1984 budget for C³ is tied to some form of MX basing?

Mr. LATHAM. The Peacekeeper missile system is required to redress the current strategic imbalance and an appropriate basing mode is expected to be selected by the executive branch and the Congress. The fiscal year 1984 budget request is structured to protect a fiscal year 1986 initial operational capability for the Peacekeeper in a closely-spaced basing (CSB) mode. R&D and Procurement funding is required for MX C³ in the amount of [deleted]. These funds are all carried within the total request for Peacekeeper. No funds requested for C³ for Peacekeeper are carried outside the Peacekeeper program. While currently structured around the C³ required for CSB, all, or a significant portion, of these funds will be required to support whatever basing mode is finally selected; and hence, any adjustment of the fiscal year 1984 C³ budget for Peacekeeper should await the basing mode decision.

SOVIET CAPABILITIES IN ANTI-SATELLITE WEAPONS

Senator THURMOND. Dr. Latham, of interest to the Committee are Soviet capabilities in anti-satellite weapons systems. These weapons pose a rather significant threat to some of our satellite systems. Would you assess the Soviet capabilities for us and describe for us what measures we are taking to protect our C³ systems in the future?

Mr. LATHAM. At the present time, the Soviets only have a low altitude co-orbital anti-satellite system [deleted]. We believe that this phased approach will provide MILSTAR with an excellent survivability capability for a very long time. Similar survivability upgrades are also being examined for DSCS III and other satellites such as DSP, GPS, and others.

MX BASING

Senator THURMOND. If the United States were to move toward some form of mobile small intercontinental ballistic missile system, as suggested by certain members of Congress, what would be the effect on our C³ program?

Mr. LATHAM. Our current C³ program could be adapted to deployment of a small mobile missile. The amount of change and specific programmatic redirection would depend heavily on the deployment concept, operational concepts for the missiles employment, and the geographical dispersion of these missiles. Specific C³ concepts will have to await a firmer definition of the system, its deployment, and its operational concept.

QUESTIONS SUBMITTED BY SENATOR CARL LEVIN

PROGRESS IN BLUE-GREEN LASER COMMUNICATION PROGRAM

Senator LEVIN. Since last year, what progress has been made in developing a blue-green laser system—either satellite or ground-based—to communicate with strategic ballistic missile and attack submarines?

Mr. LATHAM. During the past year, equipment fabrication was initiated for 1984 aircraft-to-submarine laser communication tests to investigate the feasi-

bility of providing communications [deleted] through thick clouds and dirty water at noon. This test, if successful, could permit one-way communication to more [deleted] under more benigh conditions. Lasers for eventual use in space have demonstrated [deleted] is planned this year. Both XeCL and HgBr have demonstrated electrical efficiencies [deleted]. New solid-state laser ideas are beginning to surface which may offer as much as [deteled] systems efficiency as well as providing a substantially simplified engineering development path for use in a spacecraft. For the mirror satellite approach, novel adaptive optics systems offering more than [deleted] have been demonstrated. Single pulse laser energies of [deleted] twice that required for the mirror satellite approach, have been achieved by Raman converting the output of a [deleted] Xenon Fluoride laser to blue-green wavelengths. Progress has also been made in developing the repetitive pulse technologies required to achieve the [deleted] of average power required for this approach. Adaptive optics and atmospheric compensation have been demonstrated in field experiments with a 70 channel system. Tight beams of [deleted] times diffraction limited have been demonstrated on a horizontal path, and tests to aircraft begin later this year. Deformable, controllable space mirror technology has been demonstrated successfully in half-scale breadboards in a competitive effort. However, it is unlikely that this high-risk, high-cost technology could provide an operational space-based laser communications system for submarines until the mid to late [deleted].

STATUS OF BLUE-GREEN LASER COMMUNICATION PROGRAM

Senator LEVIN. What major technical milestones and performance demonstrations have been accomplished so far in this program, and which remain?

Mr. LATHAM. In addition to technical accomplishments achieved during this past year, the most significant demonstration of SLC performance to date is the SLCAIR–81 experiment. In that experiment, [deleted]. The maximum depth at which communication was achieved under nighttime condition was [deleted]. Success of individual runs were highly dependent on aircraft positioning [deleted]. The equipment could not generate sufficient power [deleted] and with the aircraft a single mile off track, [deleted]. These results [deleted].

Remaining technical issues in SLCAIR tactical communications will be addressed during the SLCAIR–84 experiments. The feasibility of the mirror satellite approach will be resolved by [deleted]. This involves demonstration of the technology required for a high quality, [deleted] average power blue-green laser transmitter, and turbulence compensation of a low power uplink beam through the full atmosphere.

An end-to-end mirror satellite experiment at full power which would address remaining technology integration issues, might be initiated as early as [deleted]. The remaining technical issues in the laser satellite approach will be addressed by [deleted]. These technical issues relate primarily to the demonstration of reliable, long-lived, efficient blue-green lasers compatible with satellite deployment.

It should be pointed out however, that even if technically successful, it is not at all clear that we should proceed to develop and deploy such a communications system. We are actively pursuing other options for surviving, enduring communications for submarines such as reconstitutable ELF and VLF plus MILSTAR.

FUNDING FOR BLUE-GREEN LASER COMMUNICATION PROGRAM

Senator LEVIN. Provide the fiscal year 1984–88 funding profile for this program in both the Navy budget and the Defense Advanced Research Projects Agency budget—in both fiscal year 1984 (constant) and current dollars.

Mr. LATHAM. The current funding profile in then-year dollars to be provided by DARPA through the fiscal year 1985 decision is as follows: Fiscal year 1984—23,000; fiscal year 1985—19,000.

The DARPA funding for fiscal year [deleted] and beyond will depend on whether the SLCSAT mirror satellite or laser satellite approach, if either, is selected for further development. If either the mirror satellite or laser satellite approach is chosen, significant additional funds would be required in fiscal year [deleted] and beyond to proceed with the SLCSAT experiment. An actual full satellite experiment may cost as much as $500 million and funding of several billion dollars would be necessary for an operational space-based laser communications system.

SCHEDULE FOR BLUE-GREEN LASER COMMUNICATION PROGRAM

Senator LEVIN. Under this funding profile, when will the remaining major milestones and performance demonstrations be accomplished?

Mr. LATHAM. The next major milestone, the SLCAIR–84 technology demonstration, leading to a [deleted]. [Deleted] will be accomplished during fiscal year 1984. Within the current DARPA funding, the level of technology demonstrated by [deleted].

[Deleted] of an SLC satellite communication experiment based upon the relay mirror satellite concept. A decision to proceed with the laser satellite concept could not be made until at least 2 years later and would depend on development of long-lived, reliable space-based blue-green lasers. If either the mirror satellite or laser satellite approach is chosen, significant additional funds would be required in [deleted] and beyond.

ACCELERATION OF BLUE-GREEN LASER COMMUNICATION PROGRAM

Senator LEVIN. Under an accelerated program assuming Congress provides the sufficient funding, what is the earliest each of these major milestones and performance demonstrations could be accomplished?

Mr. LATHAM. The SLCAIR–84 demonstration program is fully funded under the DARPA program and could not be accelerated by additional funding. Likewise, technology development through the decision milestones for proceeding to the SLC mirror or laser satellite experiment is technology, rather than funding, limited, and could not be accelerated by additional funding.

CONSTRAINTS ON BLUE-GREEN LASER COMMUNICATION PROGRAM

Senator LEVIN. Is the present program constrained by technology or funding/affordability reasons?

Mr. LATHAM. The present program through the [deleted] SLCSAT decision milestone is constrained by technology development and represents a prudent balance between technology risk and program pace.

UTILITY OF BLUE-GREEN LASER COMMUNICATION PROGRAM

Senator LEVIN. Is it not true that the blue-green laser communication system has great potential to provide both our strategic ballistic missile and attack submarines with a survivable high data rate message transmission system?

Mr. LATHAM. Given time for development and maturation of the SLC technology, a blue-green laser communication has potential to eventually provide one-way message transmission to both strategic and tactical nuclear submarines. Although the instantaneous data rate would be high, operational system considerations would significantly reduce the effective data throughput capacity of the blue-green laser system. The laser communication system could be as survivable as any other synchronous orbit satellite communication system provided [deleted].

It is important to note however, that both of the current spaced-based laser communications approaches will be very costly. This is caused by the system complexity and [deleted].

[Whereupon, at 3:53 p.m., the subcommittee adjourned, subject to the call of the Chair.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1984

MONDAY, MARCH 21, 1983

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC AND
THEATER NUCLEAR FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

SEA-BASED DETERRENT

The subcommittee met in open session, pursuant to notice, at 8:04 a.m., in room SR–222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Members present: Senators Warner, Goldwater, Cohen, and Jackson.

Staff present: Frank J. Gaffney, Jr. and Patrick L. Renehan, professional staff members; James G. Roche, minority staff director; and Karen A. Love, staff assistant.

Also present: Dennis P. Sharon, assistant to Senator Goldwater; John Campbell, assistant to Senator Warner; Jim Dykstra, assistant to Senator Cohen; and Greg Pallas, assistant to Senator Exon.

Senator GOLDWATER [presiding]. The meeting will come to order.

I will read a short statement by Senator Warner, who is chairman of the subcommittee.

The subcommittee reconvenes today to take testimony on the contribution of our sea-based strategic forces to the maintenance of a credible, balanced deterrent. Our witnesses represent various aspects of the Navy's nuclear capabilities: Strategic policy, nuclear submarines, sea-launched ballistic missiles, and cruise missiles.

Our witnesses today representing these various perspectives are Rear Adm. W. J. Holland, Jr., Director of Strategic and Theater Nuclear Warfare; Rear Adm. Frank B. Kelso, Director of the Strategic Submarine Division; Rear Adm. Glen Clark, Director of the Strategic Systems Project Office; and Rear Adm. S. J. Hostettler, Director of the Joint Cruise Missile Project Office.

Admiral Holland, we welcome you and your colleagues to this hearing.

You may proceed as you see fit. As you know, we allow you to testify as you care to or put your complete statement in the record as read.

STATEMENT OF REAR ADM. W. J. HOLLAND, JR., U.S. NAVY, DIRECTOR, STRATEGIC AND THEATER NUCLEAR WARFARE DIVISION, OFFICE OF THE CHIEF OF NAVAL OPERATIONS, ACCOMPANIED BY REAR ADM. FRANK B. KELSO, U.S. NAVY, DIRECTOR, STRATEGIC SUBMARINE DIVISION, OFFICE OF THE CHIEF OF NAVAL OPERATIONS; REAR ADM. GLEN CLARK, U.S. NAVY, DIRECTOR, STRATEGIC SYSTEMS PROJECT OFFICE; AND REAR ADM. S. J. HOSTETTLER, U.S. NAVY, DIRECTOR, JOINT CRUISE MISSILE PROJECT OFFICE

Admiral HOLLAND. I have submitted a complete detailed statement for the record, which I can summarize briefly with your permission.

In the past year we have put to sea the *Ohio* which has completed her second patrol. We have excellent performance from the ship and systems and the crew.

The second ship, the *Michigan*, is in Puget Sound Naval Shipyard and will make her first patrol early in the summer.

The third ship, the *Florida*, has completed her first two builder's trials. The contract for the 10 Tridents is signed and work is underway.

We have completed the backfit of the Trident I missile on 12 Poseidon hulls. This has been completed and as of this time we have completed 2,138 deterrent patrols in the SSBN program.

In our missile program we are in the third year of the advanced development for the Trident II, the D–5. This missile will have an IOC in late 1989.

Senator GOLDWATER. In 1989?

Admiral HOLLAND. Yes, sir. We will have a higher accuracy and greater payload than the present missile.

The ninth Trident hull and subsequent ships will receive D–5 missile systems during this building period. The first eight ships will be backfitted during their first regularly scheduled overhaul.

The Navy studied the feasibility of accelerating the Trident II program in great detail last year. We decided not to do so because the small improvement in capability was not worth the very large additional near-term costs.

It is no longer technically feasible to accelerate the D–5 program and introduce it earlier than 1989.

As far as our future plans are concerned we could increase the SSBN building rate, but in doing so the results of such an effort would not be evident until 1992 or 1993.

It is the Navy's position we should stay at one hull per year unless there is an urgent need to increase the SLBM capability more rapidly.

We intend to retire the Poseidon submarine force after a normal 30-year life, such that by the end of this century all SLBM's will be Tridents and we will have about 20 ships.

The ultimate size of this force is constantly being evaluated and much depends upon decisions made outside the Navy and indeed outside the United States, the development of bombers and other forces, U.S. strategy and objectives, the Soviet threat and character of the Soviet target systems and effectiveness of other strategic forces and arms control considerations.

TOMAHAWK MISSILE

Finally, the Tomahawk. Recent changes in the cruise missile program have not impacted on the IOC of 1984 for the nuclear land attack version. This strategic nuclear asset will proliferate a threat not so much in numbers as in geographic scope of the Soviet Union.

The difficulty for Soviet planners to calculate the effect of this force should greatly enhance deterrence. The cruise missile will become a major contributor to our strategic reserve forces.

Our communications program receives high propriety, and although we are not here to specifically address that portion of the program today, Admiral Nagler will appear before the committee to discuss it in great detail.

Finally, we believe the program we are presenting has a proper balance and it is not necessary to accelerate at this time. We believe we can produce the Trident II missile with high confidence on time and it will meet the performance goals which we anticipate and which we have set forth for ourselves.

Senator, that completes my summary. I have a more detailed statement.

I will ask my colleagues if they would care to add anything to the statement I have made.

Admiral Kelso is here.

[The prepared statement of Admiral Holland is as follows:]

PREPARED STATEMENT OF REAR ADM. WILLIAM J. HOLLAND, JR., U.S. NAVY, DIRECTOR, STRATEGIC AND THEATER NUCLEAR WARFARE DIVISION IN THE OFFICE OF THE CHIEF OF NAVAL OPERATIONS

Mr. Chairman, gentlemen. I am Rear Admiral Jerry Holland, the Director of the Strategic and Theater Nuclear Warfare Division in the Office of the Chief of Naval Operations. My purpose today is to update you on the status of the Navy's seabased strategic deterrent. I appricate the opportunity to once again appear before this subcommittee and to participate in your important work.

Before proceeding, allow me to introduce the key people in the Navy's nuclear missile program: Rear Admiral Glenwood Clark, U.S. Navy, the director of the Strategic Systems Project; Rear Admiral Frank Kelso, U.S. Navy, the director of the Strategic Submarine Division; and Rear Admiral Steve Hostettler, U.S. Navy, the Director of the Joint Cruise Missile Project Office. I will call on them to respond to technical questions the subcommittee might have.

Since my predecessor last testified before the subcommittee in October 1981, the capabilities of our strategic submarine force have increased substantially. The U.S.S. *Ohio*, the first Trident submarine, equipped with 24 long-range Trident I (C–4) missiles completed her second highly successful deterrent patrol in the Pacific in March of this year. The ship's performance exceeded its design goals in many respects and clearly demonstrated significant improvements in survivability, endurance and turn around time.

The U.S.S. *Michigan*, which was delivered last August, is presently in a two month post shakedown availability (PSA) at Puget Sound Naval Shipyard, Bremerton, Washington. She will depart on her first patrol early this summer.

Florida, the next ship, has just completed her second builders trials and is scheduled for delivery to the Navy on June 30, 1983. The contract for the tenth Trident was signed last November and work is underway.

We have completed retrofit of the Trident I (C–4) missile on 12 Poseidon submarines. They, along with 19 Poseidon ships equipped with the C–3 missile, are conducting deterrent patrols from Kings Bay, Georgia, Charleston, South Carolina and Holy Loch, Scotland. Since *George Washington's* first patrol in 1960 our ballistic missile submarine force has completed 2,138 patrols, nearly 400 ship-years under the water.

We are now in the third year of an advanced development program directed toward achieving significantly better performance in a new submarine launched

ballistic missile (SLBM) designed to utilize the entire volume of the *Ohio* class launch tube. Although the final weapon system configuration for the new missile, the Trident II (D–5), will not be selected until later this fiscal year, it will have considerably more payload than the Trident I (C–4) missile, a major improvement in accuracy over the C–4, and a full-load range comparable to or greater than the C–4. This program will lead to a late 1989 IOC, and, for the first time, provide the United States with a survivable strategic missile system which cannot be targeted by enemy missiles and that is effective across the entire target spectrum. The ninth and all subsequent Trident submarines will be delivered with the D–5 missile system. We will then refit the first eight with the new system during their first regularly scheduled overhauls in the 1990's.

Last spring, the Navy studied the feasibility of advancing the IOC of the D–5 missile. It was found that a one year acceleration was technically feasible, but with slight degradation in performance at IOC. Any greater acceleration would have resulted in an unacceptable degradation in missile performance. It was decided not to accelerate but to continue with the 1989 IOC because the additional near-term cost for the one year acceleration was not commensurate with the improvement in military capability that would be achieved. At this late time in system development it is no longer technically feasible to accelerate the missile IOC.

The Trident program that is before the Congress reflects President Reagan's strategic modernization program announced in October 1981. It reflects the D–5 deployment in 1989 and continuation of building one Trident submarine per year. Although the building rate could be increased, with the long lead times involved we would not be able to realize the results of any increased building rate until 1992 or 1993. Unless there are overriding considerations of national importance with regard to force levels and capabilities, we think continuation at the rate of one year is adequate and prudent.

We plan to retire the 31 Poseidon hulls after they reach a nominal life of 30 years. The first will retire in FY 1993; the last in FY 1999. By the end of the century we plan to have an all Trident D–5 force of about 20 submarines; a force significantly more capable than that existing now or that will exist in the early 1990s. The ultimate size of the SLMB force depends on a wide range of factors: The overall mix between land-based missiles, bombers and cruise missiles is a major one. Of course, U.S. strategy and objectives, the threat, the character of the enemy target system, nature and effectiveness of other U.S. strategic forces and arms control considerations are also important considerations which could influence this plan. All are being constantly evaluated by the Secretary of Defense and the joint chiefs of staff.

When I testified before this subcommittee on 18 March, I discussed at some length why it is so necessary to maintain the invulnerability of our sea-based deterrent. We have all witnessed the importance of survivability in our continuing search for a survivable basing mode for ICBMs. Survivable nuclear forces significantly enhance crisis stability, allow reduced force levels without compromising national security, ease the achievement of long-term arms reductions, provide confidence to ourselves in the effectiveness of our deterrent and make our strategic policy and doctrine credible to potential enemies. We are confident that the Navy's program with its super quiet Trident submarine and long-range missile will continue to provide this invulnerable element over the life of the system.

The President's modernization program announced the deployment of Tomahawk nuclear land attack cruise missiles beginning in 1984. These missiles will be deployed on a large number of ships and submarines. This wide distribution of naval offensive strike power will enhance U.S. naval worldwide nuclear force deterrent capability by increasing the number of Soviet pact targets put at risk and introducing another major element of uncertainty into the Soviet military planner's calculus. As specified in President Reagan's strategic modernization program, given the TLAM/N's great survivability and endurance, they will become a major contributor to our nuclear reserve forces.

Subsequent to an intensive program review (completed in November 1982), significant funding shortfalls and technical problems were identified that required a restructuring of the Tomahawk program. These necessary program changes were structured so as not to impact the schedule of the nuclear Tomahawk land attack missile (TLAM/N). Approval of the TLAM/N for full production requires certification of the TLAM/N missile itself, the theater mission

planning system (TMPS), and the ship/submarine platforms on which it will be deployed. This effort is currently ongoing and will continue into 1984 in support of the 1984 initial operational capability for both the submarine and surface platforms. Also in support of the effort, the following major events either have or will occur:

Tomahawk weapon system performance base line frozen—October 1982.
Theater mission planning system certified—spring 1983.
Submarine/ship operational evaluation—summer/fall 1983.
Production of missions in support of operational deployments—1983 and on.

In summary, the Navy's Tomahawk nuclear land attack effort remains on schedule in full support of the President's program for nuclear land attack cruise missiles.

The Navy heartily endorses the top priority given to improvement of command, control and communications in the President's modernization program. Our guiding principle in C^3 modernization is to insure that the SLBM force is responsive to the needs of the national command authority. Vice Admiral Gordon Nagler, the Director, Command and Control for the Navy, will appear before this subcommittee to discuss C^3 in greater detail.

The Navy believes that our strategic program represents the proper balance between the needs of our strategic forces and those of the general purpose forces. Although we do not feel it necessary or desirable, the program could be expanded. It is important to realize, however, that the results of such an expansion or acceleration would not be felt until the early 1990s. We are confident that the Trident II D–5 missile can be produced on time and will achieve the desired performance. When matched with the highly capable Trident submarine and improvements in C^3, the SLBM force will provide the cornerstone of our strategic deterrent well into the next century.

Thank you.

STATEMENT OF REAR ADM. FRANK B. KELSO, U.S. NAVY, DIRECTOR, STRATEGIC SUBMARINE DIVISION, OFFICE OF THE CHIEF OF NAVAL OPERATIONS

Admiral KELSO. It is a pleasure to appear before this committee.

I would like to add that the third ship of the Trident class, the *Florida*, has just completed her second set of builder's trials and they have been very successful.

Following on after her sister ships, the U.S.S. *Ohio* and the U.S.S. *Michigan*, that ship is due to be delivered this summer, in June. It is possible she might deliver a little earlier, so the shipbuilding program has vastly changed in the last couple of years. It looks like the Trident ships are going to be delivered pretty much on the schedule that we now have, sir.

We have essentially completed the backfit of 12 Poseidon class ships with a Trident I or C–4 missile. The last ship will deploy in the early spring of this year after her training. So that program is essentially complete. We only intend to backfit 12 of those ships with the longer range C–4 missile.

Also, I would like to say that from a standpoint of survivability, the Navy strongly believes that the force is survivable today. We don't see anything on the horizon that would tell us we can't learn to operate the submarines correctly to maintain that survivability as far as we can see in the future. So, we believe strongly that this is a survivable force and we can sustain its survivability. That, sir, is my short statement.

Senator COHEN. It may be survivable at sea, but what are you doing about protecting the Electric Boat yard?

Admiral KELSO. Senator, Electric Boat has upgraded her security forces significantly since their last case of intrusion by protestors. We are looking throughout the Navy shipyard organizations to see what we can do to strengthen the security of all of those organizations.

Senator COHEN. What we saw last year was a situation where there was relatively little or incomplete security in most of our yards.

Admiral KELSO. Yes.

Senator COHEN. We had some nuns paddling a canoe to the yard and on last night's television show we saw that terrorists can be a little more sophisticated. When you have a group of nuns paddling in and putting a mine in one of those ships, it is not that survivable.

Admiral KELSO. Well, we agree. Through our studies we try to improve the security in all of those yards. In Electric Boat specifically there has been a fence put in and patrols have been established on the waterfront that were not there before.

We have had two occasions in recent times in Electric Boat where unauthorized people have gotten into the shipyard.

In the first one they were not detected for some time and the second time I think they were all detected within about 15 minutes and apprehended at the time they entered the yard.

The guard force at Electric Boat has been stepped up by 20 or 30 additional people since that time and we have put an additional watch on the ships topside before they are turned over to the Navy.

Gates have been put on the ships' brows and there is a check system where you can only get on by knowing how to get in. We have put various materials around the stern of the ships so that they cannot be boarded nearly as easily in the water.

So, we have taken significant steps at Electric Boat to try to improve security. I think that you are talking about an area that probably requires a lot of upgrading if we are going to be able to have good security throughout our military installations where you have large perimeters, to prevent anyone from coming in.

Senator COHEN. I am not saying it is entirely possible. I think it is academic.

Admiral KELSO. It is an issue that we are studying how to do better. We are looking at the use of dogs, which they are now using on the weekends, and we are looking at movement devices to detect movement to see if they are practical to use. It turns out that you run into a lot of false alarms with them, particularly where you have lengths of fencing where there is wildlife. We are studying how to improve our security.

Senator COHEN. I think these are the types of demonstrations that are going to intensify and increase in the coming months.

Admiral KELSO. Yes.

Senator GOLDWATER. Could I ask a question on that just for my information?

How do you share the responsibility of security with the manufacturers? Is that totally a Navy job?

Admiral KELSO. No, sir, it is a shared responsibility with primary reliance on the shipbuilder's security before the ship is delivered to the Navy. He owns the ship and he is responsible for the security, and within the contract there is a stipulation that he has responsibility

for the security. Like anything else, it is dependent upon how the contract is interpreted.

I think now the contracts are going to be strengthened to improve that. He gets paid for what security he provides and that has to be perhaps better spelled out in the future. Once the ship is delivered to the Navy, then it becomes strictly the Navy's responsibility.

Senator JACKSON. Just on the point that Senator Cohen raised, what about the operating bases? Specifically you know what I am talking about, like Bangor. We went through it this last summer right in the middle of my election.

Admiral KELSO. Bangor is a particularly difficult place to secure since it has a large perimeter, both waterfront and fence, Senator. We are looking at putting some additional fencing in at Bangor, and we are looking at waterfront patrols.

Senator JACKSON. I think specifically the waterfront.

Admiral KELSO. We are running waterfront patrols now and we are patrolling the perimeters of the base better than we have in the past. I just saw a report from the commander, Submarine Force Pacific, where he talked about the fact that he had changed the way it was done to strengthen security in that area.

I am not telling you that I think it is perfect by any stretch of the imagination, but I do believe that we are working to improve the security out there. We will continue to look for ways to preclude intruders from getting into the base.

We had, I guess, about 2 months ago, three nuns getting in the base over the perimeter fence and they were apprehended very soon after they got into the base. That is a big base with a lot of people there and we are going to continually work on security, sir.

The industrial facility is separated from the rest of the base. Getting on the base is one thing, but to get into the industrial area, where the ships are, is different.

Senator JACKSON. As you know, that is a very active area out there. It is constant and you never know when they are going to strike.

Admiral KELSO. We were worried when the U.S.S. *Michigan* and U.S.S. *Ohio* both arrived there within 2 days of each other. We didn't see nearly as many protestors as we saw when the U.S.S. *Ohio* first arrived in Bangor, possibly because of confusion over the time of arrival. I think people were planning to be active when the U.S.S. *Michigan* would get there.

Senator GOLDWATER. After delivery of these particular craft, have you ever discovered any acts or indications of acts of sabotage of any kind?

Admiral KELSO. I do not ever remember an act of sabotage on one of our SSBN's, Senator Goldwater. That is my personal memory. I will go back and look and see if I may be wrong and if I am, I will correct that for the record.

Senator GOLDWATER. Has there been anything like intentional shoddy workmanship?

Admiral KELSO. Well, we have had a couple of cases in overhaul where we had some cables that were pierced with pins, but that occurred in overhaul and it was found when we tested the systems so it could be corrected. I guess you could interpret that as sabotage. Referring to

an operating ship, I don't remember them having issues of sabotage, nor do I remember anyone being successful in boarding any of the ships.

[Senator Warner assumed the chair.]

Senator WARNER. Admiral Clark?

STATEMENT OF REAR ADM. GLEN CLARK, U.S. NAVY, DIRECTOR, STRATEGIC SYSTEMS PROJECT OFFICE

Admiral CLARK. I would briefly amplify on the comments Admiral Holland made about the Trident program. I can report that the progress in the Trident II program is indeed good and we are proceeding on the new schedule of introduction of the weapons systems in the ninth Trident submarine and again progress during the advanced development program, of which this is the last year, has been very good.

We are now planning to start the full-scale engineering development at the beginning of fiscal 1984, in October of this year.

Senator WARNER. Admiral Hostettler?

STATEMENT OF REAR ADM. S. J. HOSTETTLER, U.S. NAVY, DIRECTOR, JOINT CRUISE MISSILE PROJECT OFFICE

Admiral HOSTETTLER. I have just a brief comment, sir. The nuclear variant of Tomahawk remains the Navy's No. 1 priority in the Tomahawk program. We are proceeding to support the IOC of that variant in both submarines and surface ships in 1984.

We will go through the development test/operational test (DT/OT) test period this year and I look forward to a successful series of tests during this period.

Senator WARNER. We will now go to questions. The Chair intends to remain here throughout the hearings so I will be happy to defer to my colleagues who may have other commitments.

ACCURACY OF D–5

Senator JACKSON. Mr. Chairman, I wanted to ask about the accuracy of the D–5 which has an IOC of 1989, as I understand.

This gets involved in the MX issue as one of the possible supplemental factors with the MX, in a land-based version of it.

First of all, what is the accuracy of our missile speaking in operational terms of the fleet.

Admiral HOLLAND. We can't go into that in open session. I may be wrong, Senator, I was told we were in open hearing.

Senator WARNER. We are in open session, but we can move to executive unless anyone has a question.

COMMUNICATIONS

Senator GOLDWATER. You touched on communications. Are you still concerned about low frequency communications for submarines and the effect that the different States might have on that project, the States that have denied low frequency antenna structures?

Admiral HOLLAND. No, the extremely low frequency system is being installed now and going forward in a limited deployment in Michigan.

Senator GOLDWATER. How about high frequency VHF? Do you use both of those on submarines?

Admiral HOLLAND. We use high frequency, sir, but that is a standard Navy antenna system or standard Navy communication system and it is not dedicated to strategic services alone.

There are no particular problems in that particular area.

Senator GOLDWATER. What happened to the idea that you studied for a while of using communications with satellites to reflect back down to command?

Admiral HOLLAND. You mean satellite communications? Yes, we have that ability now and in the improved system.

Senator GOLDWATER. Are you running into the same problems with the other services and everybody who communicates? You buy a piece of equipment today and it is no good tomorrow, is that about the truth?

Admiral HOLLAND. I am not competent to make that judgment. It is not my experience, anyway.

Senator GOLDWATER. Thank you. I will discuss that later with another witness.

Admiral HOLLAND. All right.

Senator JACKSON. Again, Mr. Chairman, I want to ask about the accuracy of the D–5, which has an IOC of 1989, as I understand. This gets involved in the MX issue as one of the possible supplemental factors with the MX, in a land-based version of it.

First of all, what is the accuracy of our missile speaking in operational terms of the fleet?

Senator WARNER. We will go into executive session and the question can be answered at that time.

[Whereupon, at 8:23 a.m., the subcommittee proceeded in executive session.]

EXECUTIVE SESSION

Senator WARNER. We are now in executive session, Admiral Holland, so could you please respond to Senator Jackson's question.

Admiral HOLLAND. To answer your question, the present Circular Error Probable [CEP] for C–4 missile is [deleted] feet at 4,000 miles. Our design goal for the D–5 will be to have [deleted] feet at 4,000 miles.

We expect to improve that [deleted] feet in the succeeding 2 or 3 years and I would defer beyond that to Admiral Clark for technical details.

Senator JACKSON. That is a substantial improvement, starting with the original missiles for the fleet. That is [deleted] feet?

Admiral HOLLAND. It is not quite what we set out as the design criteria for C–4 when we started to build it. [Deleted] feet was what we started up with.

Senator JACKSON. And you ended up with [deleted].

Admiral HOLLAND. Yes.

Senator JACKSON. Let me see, we are talking about a yield on those missiles, of what, of [deleted].

Admiral HOLLAND. No, sir, the D–5 will deploy——

Senator JACKSON. No, I mean the C–4.
Admiral HOLLAND. [Deleted] yes, sir.
Senator JACKSON. And then the C–5, or the D–5?
Admiral HOLLAND. [Deleted] at the present time.
Senator JACKSON. So that will give you a hard target capability?
Admiral HOLLAND. I am sorry, it is [deleted].
Senator JACKSON. That will give you a hard target capability?
Admiral HOLLAND. Yes, sir.

Senator JACKSON. Let me ask you, on cruise missiles, the move now is for a Stealth characteristic to follow ultimately. There is some Stealth characteristics in the original Alcum, but if we are doing that in connection with the air-launch cruise missile, why aren't we doing it on the SLCM's, or the Tomahawk?

Admiral HOSTETTLER. I haven't a good answer for you. I think it is a combination of things.

First of all, the data would indicate that versus current systems the Tomahawk is an extremely survivable weapon so we are talking at some point out in the future.

First, the ALCM mission is somewhat different than the Tomahawk mission. The targets, strategic targets for the ALCM on the initial salvoes are going to be difficult ones. It would seem that the Air Force would have a much more stringent requirement for survivability against those initial targets than would Tomahawk even today.

Tomahawk is a strategic reserve weapon and will not be targeted necesarily against those prime targets and if so, I asume they would be in a followup mode or a backup mode.

Therefore, the survivability requirements of the ALCM are significantly different.

Senator JACKSON. I understand one is primarily a nonstrategic operation, that is the Tomahawk, but on the GLCM's, on the ground-launch cruise missile, are we not moving again for the Stealth characteristics?

This is a system that you do not know how long will remain survivable either.

Admiral HOSTETTLER. Of course, in the case of the GLCM, the survivability of the platform, while not as good as we would have from a submarine launch or a diverse set of surface ships, nonetheless is reasonably survivable.

As you know, we deploy from those bases on very short notice, [deleted]. You have a flight going into the field and once in the field we can set up [deleted].

A recent 30-day training exercise at Fort Lewis, Wash., indicated that once deployed, GLCM sites could not be seen by either satellite or TACRECE. During this exercise we moved these units about every 3 days.

We have a firm, survivable site based on what we know now.

DETECTING OUR SUBMARINES

Senator JACKSON. Well, I have one other question, Mr. Chairman.

The advantage of our submarine launch missile effort has been survivability. We hear that the Soviets are making greater and greater

progress in being able to locate our subs and to be able to follow them, maybe not in a precise way, but they have really concentrated heavily in developing a system or systems of detection.

Am I right in that?

Admiral HOLLAND. They are working very, very hard on that. We do not believe that they are particularly successful at it, and we have no instances or evidence that they are particularly successful.

I think the Chief of Naval Operations has put it very succinctly before the Appropriations Committee when he said the oceans are growing more opaque and not less opaque as we learn more about them. We are learning how to build submarines that are quieter than any of their predecessors. The quietest submarine in the world is a Trident submarine. It is very, very difficult to find.

Senator JACKSON. How are the relative rates? They are turning out subs with a quieter performance?

Admiral HOLLAND. Than they previously have.

Senator JACKSON. It is all relative?

Admiral HOLLAND. Yes, but we are still ahead.

Senator JACKSON. We are substantially ahead or where are we?

Admiral KELSO. You are speaking from an acoustics standpoint. We have, Senator, started out in a favorable position from acoustics. Acoustics means you have to have ability to hear with sonar and you have to have a quiet submarine. We have continually improved the submarines that we have built from the standpoint of quietness and we continue to improve the sonar.

Our submarines today have gotten to the point of quietness that our submarines are not a very good adversary to find and locate, particularly in large ocean areas, as are other submarines because they are simply so quiet.

The sonar is not able to overcome it. The U.S.S. *Ohio*, for example, is probably the quietest submarine we have ever built and probably the quietest submarine in the world. Even with our sonar technology, we can only detect one of our submarines at [deleted] yards. If you take from a vast ocean that you can operate a submarine like that in, [deleted].

We similarly have a difficult job to locate our own submarines, even with our sophisticated ASW capability. This is true particularly when you consider a submarine where the primary job is to stay out of the way and not be detected. So, from the standpoint of ocean search, which is basically what you have to do to put the SSBN force at risk, [deleted].

Acoustics is an interesting area and there is a lot of work going on in nonacoustics. In our SSBN security program we look at the technologies that could come forward in the future and not just those of us in blue suits, but we ask some of the finest scientists in the country to look at those technologies.

What people generally forget, when they think about a technology, is that just because you have a technology doesn't mean you are able to kill submarines. The equation includes technology, the ocean environment, resources to do it and the ability to execute it, which involves both communications and your ability to make a kill.

Knowing most of those technologies and the scientists whom I know that know those technologies, we do not believe that there is any so-

called big breakthrough on the horizon. There may be improvements in tactical ASW, but they are going to still require huge resources to ever make ASW capable.

When you talk about 40 million square miles of ocean area where we can operate with missiles like the Trident I (C–4) and the Trident II (D–5), that is a very, very major proposition for anybody to have the forces to ever do that.

Certainly we don't have those kind of forces today to do that. You certainly would be able to see anyone building those kind of forces because these are in the order of magnitude of hundreds beyond what they have today. So, there may be a technology that improves ASW, but not one that is going to make the oceans transparent. I don't know anyone who sees that.

Senator JACKSON. With the increase in range, obviously, for your missile systems, you have a greater playpen in which to operate?

Admiral KELSO. It is very important.

Senator JACKSON. Which is a part of the most effective defense deception.

What I was wondering is, do we really know [deleted].

Admiral HOLLAND. They would have [deleted] for us to know. We work very hard to create situations to give us [deleted], Senator, and we [deleted].

It is sort of like deterrence. Does deterrence work? We haven't had World War III so apparently it has, but we have not been able to find in an open ocean kind of a situation, [deleted].

The number of resources that the Soviets would have to devote [deleted] would be enormous. It really would be, even if they had the capability.

As a member of our own submarine forces assigned the job to in fact do what you told me you want to find out, if the Soviets do, I found it was impossible to do. [Deleted.]

Senator JACKSON. I guess my concern is whether they are in fact [deleted].

Admiral KELSO. [Deleted.]

Senator JACKSON. And you verify it?

Admiral KELSO. [Deleted.]

Senator JACKSON. Now, let us look at it the other way.

How effective have we been with the improvements the Soviets are making [deleted].

Admiral HOLLAND. We have to go above the level that we are cleared to go here.

SUBMARINE FORCE CAPABILITY

Senator JACKSON. That is something that I think, Mr. Chairman, that we should take a hard look at because the capability of our submarine force is a big part of the strategic debate. I think that is a matter that I would like to get into.

Admiral KELSO. I can answer it to a certain degree, in the way of what you have to do to make a capability, to have that happen.

Senator JACKSON. Let us ask without any classification, but not getting into methods, that is what you are concerned about. Do you have a mid degree or medium degree of confidence [deleted].

Admiral HOLLAND. Are we going to go to the open ocean [deleted].

Senator JACKSON. I am assuming that you have the necessary information from the two big choke points, out of Vladivostok?

Admiral HOLLAND. [Deleted.]

Senator JACKSON. I am assuming that [deleted].

Admiral HOLLAND. Let me suppose [deleted] because we happen to have some assets of some kind already there. But there would be [deleted].

Senator JACKSON. Once they break loose?

Admiral HOLLAND. Unless they [deleted].

[Deleted.]

Admiral KELSO. Let me approach your question and turn the tables another way, and maybe I can answer for you.

As I think you are aware, [deleted]. The ability [deleted]. You must have [deleted].

If you run the simplest kind of operational research one will find things, if you don't have a significant advantage, [deleted].

Now, for him [deleted].

So, I think from a technological standpoint [deleted].

Senator JACKSON. How much of a lag is there in these areas [deleted].

Admiral KELSO. If you plot what they are doing, you can certainly see they are improving. I would say you are talking about in the [deleted] range is the best that they can do to reach the same sort of thing. You have to, I think, assume probably longer than that, but you have to assume [deleted].

They are going to get there someday, but even if they get there, our ASW capability might not be very good, [deleted].

Senator JACKSON. [Deleted.]

Is that a fair statement?

Admiral HOLLAND. That is a fair statement.

Admiral KELSO. I think they will do as much as we do, because they do have some advantages, but I think that is a fair statement.

Senator WARNER. [Deleted.]

Second, [deleted].

Admiral KELSO. From the standpoint of a big open ocean, I would agree. I can't say [deleted].

Senator WARNER. [Deleted.]

Admiral KELSO. I don't have a crystal ball to tell you, with certainty, but my assessment is that based on the studies we do on that, I think that is right. [Deleted.]

Senator COHEN. How would you know whether they would have a breakthrough or not in ASW technology?

Admiral HOLLAND. Implicit in these questions is the idea that somehow they are going to know something that we don't know and there is some technological lead that they can gain that we will not gain.

Senator COHEN. Or that they can have access to it by penetrating?

Admiral HOLLAND. Let us presume that the technology lead-follow lag as a 3- to 5-year lag, no matter who is ahead. We have demonstrated with bombs they will follow us by [deleted] so I think it is fair to make the same general conclusion in technological areas such as ASW.

It is to the United States' advantage if we could create an ASW situation in which the oceans would be transparent. We have a major Navy and we want to control the oceans and they have a smaller navy and they want to do the commerce raiding, and so it is to their advantage to keep the oceans opaque.

It is to their advantage because they have the lesser capability navy and because they do not depend on sea lanes of communication and we do.

It is to their advantage to work very, very hard to create situations in which ASW is at a disadvantage rather than an advantage.

So, if I was in the Soviet Navy's position, I wouldn't be going out looking for ways to improve ASW to fight American forces. I would look for ways to protect my own submarines and keep my own forces safe from ASW systems.

Now, enlarging on that, Senator, what I am trying to say is that we work very, very hard at this. Admiral Kelso runs programs of several million dollars each year to try to look at ASW technology and its relation to the vulnerability of our SSBN's.

Senator COHEN. Your last statement indicated that if you were their adviser, you would try to make your own ships less vulnerable than ours. But that assumes we are taking an offensive approach and they are assuming a defensive posture.

In fact, most of our planning is predicated upon the fact that they are trying to develop a first-strike capability and not simply concerned about protecting themselves against a first strike by the United States.

Admiral HOLLAND. I was perhaps framing an answer in a more conventional way. If you make the assumption the Soviets want a splendid first-strike capability, their work in ASW will be to attack the American SSBN, and thereby create such a splendid first-strike capability.

Senator COHEN. Isn't that what our war games are predicated upon, on a potential first strike? [Deleted.]

Admiral HOLLAND. I have seen scenarios and we work some of those, but none in which ASW plays a role.

Senator COHEN. But you are suggesting you put more resources into quieting your own forces to make them less detectable rather than trying to gain an offensive detection capability against the United States.

That assumes you have no desire, I suppose you could rationalize that you are not concerned if you start the war, whether your submarines survive or not.

Admiral HOLLAND. Particularly if I am going to use them right away. If I am going to keep them for a second strike role, then I am going to hide them.

SOVIET SHIP "TYPHOON"

Senator COHEN. Let me ask you a few questions.

Why would the Soviets build a submarine, the size and capability of the Typhoon?

Admiral HOLLAND. I think that is the next stage in improving their force.

Senator COHEN. The speed is not that important in terms of an SSBN, is it?

Admiral HOLLAND. I don't believe it is, but it is nice to have. On the Soviet design of the *Typhoon*, there is some disagreement within the intelligence community as I understand it, how they put that ship together. One of those sorts of disagreements is that they may just have gotten speed as a byproduct along the way.

How fast it really goes, I don't think we really know.

Senator COHEN. What are the estimates that you have seen?

Admiral HOLLAND. I can't quote them.

Senator COHEN. [Deleted] is what I recall.

Admiral HOLLAND. Oh, no, not on ours.

Senator COHEN. I am talking about Typhoon.

Admiral HOLLAND. I saw an estimate of [deleted] knots. [Deleted] knots for an Alpha, I would have to find that out and provide it to you. But it certainly is not in the [deleted] knot range.

[The information follows:]

SOVIET SUBMARINE SPEEDS

The speed of the Soviet *Typhoon* SSBN is estimated to be [deleted]. The *Alpha* SSN is estimated to be capable of [deleted].

Senator COHEN. Tell me about the rate of production. When you talk about ASW capability, the key is not on its acoustical detection, but if you are putting a submarine out at the rate of one every [deleted] one of these is going to have a separate quality of its own?

Admiral HOLLAND. That is the resource problem that Admiral Kelso was talking about in ASW.

Senator COHEN. But they are building lots of submarines.

Admiral HOLLAND. One every [deleted] makes me very uncomfortable.

Senator COHEN. We were told that last year.

Admiral KELSO. That is right, they are building a lot of submarines, but you are talking about going in large oceans and searching for it. It is not a good ocean searching technique. The best that I could ever envision is approximately [deleted] and when you are looking at these vast areas, [deleted] submarines is nothing. You need thousands of them and they are not building submarines at that kind of rate, so you have got to look at the search rate.

If you have a platform like that, and to make it difficult, it might make it difficult to get out of a fjord.

Senator COHEN. What is the building rate?

Admiral KELSO. [Deleted] ships a year, and we will answer that for the record.

[The information follows:]

SOVIET SUBMARINE BUILDING RATE

[Deleted.]

Senator COHEN. Is that all classes?

Admiral KELSO. All classes. They build about 3 to 1 attack submarines versus U.S. attack submarines.

Senator COHEN. We build two and a half a year, roughly?

Admiral KELSO. Our building rate on the last 4 or 5 years has been a little under two, and the current plan runs to about three a year and starts four a year in some of the out years.

Senator COHEN. How many missiles will the Trident carry?

Admiral KELSO. Twenty-four.

Senator COHEN. Times [deleted] heads?

Admiral KELSO. It depends upon what the warhead is. The Trident II D–5 will be designed to carry a new one, and will probably carry around [deleted] of the new warheads or of up to [deleted] the Mark IV, [deleted] warheads that are currently carried on the C–4. That is its full payload.

Senator COHEN. So you expect to have 25 when the program is completed?

Admiral KELSO. Yes.

MISSILE GAP

Senator COHEN. Is there going to be a missile gap, a submarine missile gap that will occur in the early nineties?

Admiral HOLLAND. I am not sure what that is.

Senator COHEN. In terms of the number of submarines you are going to be putting into the force, compared with the retirement figures of the Poseidon. There is no diminution of your projected submarine force?

Admiral HOLLAND. We don't intend to measure the capability of the force by static measures like total number of weapons. We tend to measure it against the target base, sir, so that capability against the target base will go up.

Senator COHEN. I understand that, but the number of ships, I am talking specifically with respect to delays in IOC's, the production rate of the Trident. There have been some problems there.

Admiral KELSO. Senator, we currently have 31 of the Poseidon ships that are operational and 12 of those have been backfitted to carry the Trident I C–14 missile, and the others carry the Poseidon C–3, which is a pretty substantial force in itself. Those ships retire, based on 30-year lifetime, starting in the early nineties, and they go out over about a 6-year period, since they were built in about a 6-year period.

Obviously whatever happens to the size of that force over the next few years is also a political question as to what we in this country do as far as arms control limitations.

By some of the treaties we are limited to a certain number of missile launchers. I don't see anytime until that total force retires that we would be under that limitation and in fact we would be well over that limitation if we don't do something to reduce it.

As the President has said, we intend to stay with the SALT treaties, so we face a position where we would have to retire ships that are still perfectly capable of functioning in the Strategic Nuclear role.

Now, if you talk about a 20-submarine force at the end of this century, it will be a smaller number of missile tubes than we currently have operational. From a standpoint of capability it will be a far more capable force as far as warheads on targets.

Senator COHEN. I was looking at the SLBM launcher level. It seems to reach a peak then it drops down in 1998, down to 490.

Admiral KELSO. But you are replacing those ships with 16 missiles with a 24-missile ship, too, so your capability is not going to degrade

if you count tubes. You will reach a reduction unless the Trident shipbuilding rate were changed in the intervening years.

Senator COHEN. You also are saying you could actually reduce the numbers and yet still maintain or even increase the capability by improved accuracy and distance.

Admiral KELSO. Certainly, by increasing the size of the warhead and the accuracy, you improve the capability because to take out any one target, you can reduce the number of warheads per target that you have to shoot, when you reduce that number, the force becomes more effective, yes.

FREEZE RESOLUTIONS

Senator COHEN. Have you followed the freeze resolutions introduced in the House?

Admiral KELSO. I have read them, yes.

Senator COHEN. Would it be your understanding that if you have a freeze resolution passed by either House, that would freeze production of the Trident submarine?

Admiral KELSO. I don't know the answer to that. I have read it and I can't interpret it. I would believe that there might be some who would interpret it that way, that it would freeze all new production, but I don't know. I am not a lawyer and I can't tell you exactly what it says in that regard.

Senator COHEN. You shouldn't apologize because the chairman of the Foreign Affairs Committee over in the House doesn't know what it stipulates either. He was asked, specifically, on a number of occasions during the course of the debate on what the impact of the freeze would be.

It seems to me we ought to make some assessment of that because there are Members of the Senate who are proponents of a freeze resolution which as I understand, says you will freeze research, development, and production of all nuclear weapons. That to me means you will freeze the production of the Trident, the B–1, the MX, and any other system currently under research and development and deployment.

What is ironic about this is that I have talked to a number of Members asking them if they want me during the markup of the authorization bill to cancel the Trident. They said, "For God's sake, no, don't cancel that, we support the Trident."

Senator JACKSON. Would the Senator yield?

I think if you read or get the record of the hearings on this between Richard Perle and Mr. Markey, Mr. Perle made that point, the point being fundamentally that it stops all modernization.

I don't think that there is any question that it refers to any testing, any modernization of the existing systems and that goes to part of the problem. The Soviets have been modernizing for the last 15 years and we have not. I think one of the interesting things in that debate in the House was that the proponents hadn't done their homework and that is why it is being postponed until after the Easter recess.

It reminds me of that old injunction of the fictional and humorous character at the turn of the century named Josh Billings. He says it isn't ignorance, it is what people know that isn't so.

TOMAHAWK MISSILE PROGRAM

Senator COHEN. On this talk about the Tomahawk missile program—and Senator Jackson asked you about that—can you give us an update on where that program stands now, in terms of items, and cost and status?

Admiral HOSTETTLER. The land attack, nuclear Variant is scheduled for initial operational capability [IOC] in June of 1984 from both submarines and surface ships—torpedo tube launch from submarines and armored box launchers from surface ships.

We will be commencing our submarine DTOE firings, which will ultimately form a basis for that IOC this summer.

Senator COHEN. There was a report last week indicating another failure of firing the Tomahawk. Could you tell us about that?

Admiral HOSTETTLER. It was launched from the U.S.S. *Merill*.

Senator WARNER. Could you give us the specifications of the Tomahawk, what it was supposed to do?

Senator COHEN. What it was supposed to do, IOC, and the numbers and the cost, because these are all problems.

Admiral HOSTETTLER. The Tomahawk land attack nuclear Variant, a very similar missile in configuration to the ground-launched Air Force Variant which is to deploy this year in England, will commence development operational testing at sea in a submarine this summer.

Submarine testing of this Variant will be followed in the early fall with tests from a surface ship—same missile Variant, but a different ship system.

Subsequent to completion of the operational evaluation of the missile and submarine system there will be the necessary nuclear surety tests, evaluation and an inspection as well as configuration of warhead production. We need approximately 10 months from completion of operational evaluation until IOC of a nuclear version to complete these subsequent tests.

That IOC is scheduled for [deleted] 1984. While the schedule remains in my view at medium to high risk, I believe we are going to make it.

Now, with regard to the recent flight——

Senator COHEN. Let me ask you, meeting that IOC is medium to high risk, but the numbers are different. Assuming you reach the IOC by [deleted] 1984, you are talking about at least—how many Tomahawks are we talking about?

Admiral HOSTETTLER. Under our restructured program, in the 1982–83 timeframe we reduced the total numbers of Tomahawks, but we did not reduce the numbers of the nuclear Variant.

So, the only ones that we dropped, 63 rounds in the 1983 timeframe—the conventional land-attack Variant only. Those were deferred to outyears to give us an opportunity, one, to reduce the risk of meeting the IOC of the nuclear Variant as well as the antiship Variant, as well as to enhance the end game capability of the conventional land attack Variant.

So, the nuclear land attack numbers have not been changed. Those remain the same as they were.

Senator COHEN. Tell us about the recent test.

Admiral HOSTETTLER. The recent test is what I call the fifth in my series since I recertified the program in early November. As you recall, the program had come to a halt last summer due to various deficiencies as perceived by the Navy's operational evaluation force.

Subsequent to November I certified the missile for continued developmental tests. Not operational, but developmental test only. We have since launched five missiles. This launch was from the destroyer U.S.S. *Merill*. The missile was a conventional land attack Variant which was to have flown from the vicinity of St. Nicholas Island off the west coast and then proceed 80 miles in a northerly direction to a landfall south of Vandenberg Air Base. The missile then was to have proceeded in over the mountainous area toward China Lake in the desert. Then the missile would head up across China Lake and ultimately up into the Tonopah test range in Nevada.

The total flight would have been approximately 750 miles, a little over an hour's flight time. The target was actually a point in space. [Deleted.] We also structured the test to enable us to determine missile accuracy against a horizontal target on the ground. Therefore, we had a net target beyond the point in space so that we could mark with photography as well as optics the missiles' accuracy at both points.

The flight was launched successfully and there were no ship systems anomalies. The flight also boosted normally, went to normal cruise, and flew its planned trajectory to the beach. Enroute to the beach, the ship had added a navigation point, and the missile turned in accordance with the ship's instructions. When it reached its landfall point, then the computer system within the missile took over from there and turned the missile to shore. As it was approaching its first landfall map, with all data at that time looking good after some 22 minutes of flight, we received word that we had lost data and the missile clobbered.

By the way, it clobbered into the side of a hill at [deleted] and buried itself some 5 or 10 feet into the bottom rock and clay and there wasn't too much to retrieve, although we got out everything we could.

In the subsequent analysis by a sizable number of guidance people as well as air vehicle personnel it was determined that we had a flight guidance computer failure. The computer itself did not stop computing, but—in fact, it was computing in an erroneous manner such that while the missile was performing all of its functions, it was not receiving the digital guidance that it needed to control the surfaces.

I will tell you as of today I do not know the root cause of the computer failure. It is very difficult to determine. We do know that we did have a memory rearrangement, which could have been caused by a particular failure in the computer itself or could have been caused by a momentary power loss external to the computer, and we will eventually come up with the root cause.

It was a disappointing flight. We wanted that one badly. We are at the present time under preparations for another surface shot. The guidance set in the next surface shot will be the very latest guidance set that we have produced, having come off the assembly line in January, with all of the latest modifications, I might say in the shot that I fired last month we did not have that flexibility. We had a recent vintage, but not the full up-to-date guidance system.

That is the present situation.

Senator COHEN. One final question.

D–5

Senator Jackson was asking you earlier about the D–5. The D–5 is about 44 feet in length?

STATEMENT OF REAR ADM. GLEN CLARK, U.S. NAVY, DIRECTOR, STRATEGIC SYSTEMS PROJECT OFFICE

Admiral CLARK. Yes, that is correct.

Senator COHEN. Have you been consulted by the blue ribbon MX commission in terms of whether that type of missile can be made, in fact, land mobile?

Admiral CLARK. Yes, we have in the context of development of a common missile, a missile to be common to both the Trident submarine and the land-based system.

Senator COHEN. What is your assessment?

Senator WARNER. Mobility is what he said now, and not land fixed.

Admiral CLARK. I haven't briefed them on making the D–5 mobile, I missed that part of it.

Senator COHEN. Do you have any judgment on that as to whether or not that missile could be made mobile in a land-based mode?

Admiral CLARK. Certainly if there is a consideration at the beginning. The development of the missile, to make it compatible for both submarine and mobile land-basing scheme you can do that. Certainly it would impact on the design some way depending upon what that specific mode would be.

Senator COHEN. If it is not too large, looking at the MX, for example?

Admiral CLARK. The missile (D–5) is quite a large missile, 125,000 pounds, and that, of course, would be a disadvantage from a mobility standpoint on land.

It is my own view that if you are going to build a mobile missile on land, you would probably like it to be a good deal less than that in weight, but it is certainly technically feasible.

Senator WARNER. It is a very important question and I am not entirely sure that the answer is responsive.

Your answer was if you started at the beginning with a joint program of mobility, land and submarine, you could probably conceive it and build it. But that is not the case.

We are pretty well along with that D–5.

Admiral CLARK. We are not finished.

Senator WARNER. With the design and so forth?

Admiral CLARK. No, we don't really begin the detail design of that missile until this year. In fact, we just started it.

Senator WARNER. I stand corrected. I thought we were too far along to go back and work it and make it a mobile missile?

Admiral CLARK. We could make some modifications in the design because we just started.

Senator WARNER. Then you could make the missile mobile, but would end up with a missile that is far larger than the desirable mobility?

Admiral CLARK. That is my own opinion. A 125,000-pound missile is pretty large.

Senator WARNER. Could you go back and redesign it and make it for purposes of the submarine and make it mobile and make a smaller one?

Admiral CLARK. One of the objectives in the D–5 program is provide as much warhead capability as well as accuracy that you can in order to make the SSBN force quite effective against the hard target.

So, the D–5 system as conceived was to make it large enough to fill the entire volume of the Trident submarine and that is what is driving the size of it at the present time.

Senator COHEN. You are building the missile to fit the sub?

Senator WARNER. To use the full space that you have, and the weight characteristics of the sub, but now I suppose it would be possible to go back and make a land-mobile missile and at the same time utilize a less percentage of the capability of the submarine and weight?

Admiral CLARK. It would make it considerably less effective, and significantly reduce the size of it.

The C–4 is about 69,000 pounds and that is no small missile either.

Senator COHEN. What if you decided to make the land-based missile, not MIRV'd? Henry Kissinger wrote a piece in which he advocated going to a de-MIRV'd system as far as land-based systems were concerned and going to a single warhead mobile system.

Admiral CLARK. It would require a great number of launch tubes if you were going to have the same effectiveness.

Senator COHEN. He is talking about a land-based system. You don't have to have that big a missile if you have a single warhead.

Admiral CLARK. No, I think that is one of the major things under study, a relatively small missile with a single warhead. To have a total capability it would be comparable to what now exists in the ICBM force.

Senator JACKSON. Right on this point, I think there is a strong possibility that the Commission, the MX Commission or whatever it is, is going to come in with a mixed proposal, that is X number of MXs and a follow-on system which would be mobile and which obviously would draw on the technology of the D–5.

I gather what is being said here this morning is that you cannot simply lift the D–5 for the strategic submarine force and put it out as a mobile, land-based system.

Is that a fair assumption? I am just speaking on the technology.

Admiral CLARK. From a technical standpoint there would have to be some modifications of the missile to make it compatible with that land-based system. We have not really studied that in detail at all. This is practically the essence of our study here this morning.

Senator COHEN. But could it be done from a technical point?

Admiral CLARK. Yes.

Senator WARNER. What did you say there?

Admiral CLARK. It is technically feasible to make the D–5 mobile land based.

Senator WARNER. But you might end up with a totally unusable system and it is too big to transport. What is the weight of it?

Admiral CLARK. 125,000 pounds.

Senator WARNER. How do you take 125,000 pounds and run it around?

Admiral CLARK. Not easily.

Admiral HOLLAND. I have been supporting the Commission's inquiries into these areas.

Senator JACKSON. And you have had a lot of questions on it?

Admiral HOLLAND. Yes, on the conversion of the C–4, the 69,000-pound missile that Admiral Clark mentioned, the Commission found real problems. I don't have the Commission's judgment, but the problems of moving them and transportability that occur are evident when you do the analysis.

Technically it is feasible, but it becomes very, very difficult and there are other ways to obtain that capability without that particular device, I believe.

Senator JACKSON. I think, Mr. Chairman, the point that needs to be made here is whether there can be a concurrent operation, one addressing the program as it has been constituted for some time for the Navy and that is for the submarine program, the D–5.

It seems to me that there would be a lot of savings if you could have a concurrent land-based approach, moving along together.

Senator WARNER. A common missile?

Senator JACKSON. No, I remember the TFX too well, about commonality, and that is one of the biggest fictions of the 1960s, but it is not commality, but commonality in various segments of it and the overall characteristics, but accommodating to the land requirements and accommodating to the sea requirements.

You are set pretty well on what your sea requirements are and you are going down that road now, is that not correct?

Admiral CLARK. That is correct.

Senator JACKSON. And IOC of 1989. You don't want to tinker with your IOC for the submarines. I agree on that.

Admiral KELSO. I believe it was technology that we would defer that might be beyond some state of the art that would be used.

Senator JACKSON. How much commonality would there be?

Admiral KELSO. You are talking about the transfer of technology, or development at the same time. There is a good bit of that from MX to D–5 in that we would look at technology that they might have deferred. When you look at the missile manufacturers, there are very few anyway, and a lot of them are common between the two programs, so I think you would see a lot of the spin-off of the technology from one to the other.

Senator JACKSON. That is what I am trying to get at, and what the overall weight will be or should be, will depend on where you are going to deploy.

As you know, in the mobility suggestions that they are kicking around now, Mr. Chairman, the missile would be more or less confined to relatively large military reservations, to avoid getting into the interstate system. But they are very large military reservations that are available to handle some pretty hefty weapon systems.

SS–16A MOBILE SYSTEM

Let me ask this question. The Soviets, of course, have the SS–16 mobile system and we are getting out of the Navy for a minute, but the third stage of the SS–20 which you can put on in 2 or 3 hours and gives it an ICBM capability, I wonder what the overall dimensions of

the SS–16 is in terms of total weight or the SS–20 with a third stage on it which is an SS–16 improved.

The Russians abandoned the SS–16 and moved as we all know to the first and second stages with improvements on the SS–16.

Admiral HOLLAND. I would have to bring you back an answer on that. It is in the 80,000 to 100,000-pound category. It is a big missile.

[The information follows:]

SS–16 CHARACTERISTICS

The launch weight of the SS–16 is estimated to be [deleted] pounds, plus or minus [deleted].

Senator JACKSON. It is within the D–5.

Admiral HOLLAND. It is within the C–4, significantly less than the D–5.

Senator JACKSON. What about, as the chairman asked, with a single warhead instead of a MIRV'd warhead, what would that do to the overall configuration?

Admiral HOLLAND. Could the United States field a mobile missile?

Senator JACKSON. Some modified with one warhead.

Admiral HOLLAND. If you go to one warhead, you can take something like a Pershing II. Again you don't need to lift as much weight, and you get a smaller missile and you can get that more cheaply from some of the other missile developments rather than trying to scale down the D–5 or C–4.

Senator COHEN. What is the range of the Pershing II?

Admiral HOLLAND. You can make it a [deleted] mile missile if you want to do that. Again you are asking me to make a comparison in an area in which I am not competent.

Senator WARNER. It is your judgment you have an IOC of 1989 and you better not try and go back and redesign that or you are going to miss the IOC?

Admiral CLARK. That is a correct statement.

Senator WARNER. While you have substantial technology transfer from the D–5 to any land-based mobile system, it is just unlikely that you can have a common missile?

Admiral CLARK. Yes.

Senator JACKSON. I have one other question. I don't know how sensitive it is, I guess it isn't too sensitive.

How many of our strategic subs, the missile launching subs, of course, are at sea on the average, what percentage?

Admiral KELSO. It usually runs around 50 to 55 percent, sir.

Senator JACKSON. That is at sea and another half in port?

Admiral KELSO. Yes, generally. Right now you have eight in overhaul, so you have some in overhaul.

Senator JACKSON. That is continuous?

Admiral KELSO. Yes, one will come out and another one will go in.

SALT I AGREEMENTS

Senator JACKSON. Mr. Chairman, I had just one other question and that is to refresh my recollection on SALT I.

We were limited to 44 subs with 16 launchers or 704, just checking my arithmetic.

Admiral HOLLAND. I don't believe it worked out quite that way.

Senator JACKSON. We didn't go to 44, we had 41.

Admiral HOLLAND. Yes, sir, but I believe the agreement was we were to agree to 656 tubes which were the existing number even though that is only 42 submarines.

Senator JACKSON. Or 41.

Admiral HOLLAND. And the extra ones were allowed us, but we didn't get those in tubes. The tube number was 656 even though the hull limit was greater.

Senator JACKSON. The Soviets were allowed 900 and something?

Admiral HOLLAND. Yes.

Senator JACKSON. Is that correct?

Admiral HOLLAND. I don't have the exact number.

Senator JACKSON. A little over 900?

Admiral HOLLAND. Yes.

Senator JACKSON. Now SALT I has expired, is that right?

Admiral HOLLAND. That is right.

Senator JACKSON. What is the limitation now in SALT II that we are following, but not ratified?

Admiral HOLLAND. We are following the limitation of both agreements, sir.

Senator JACKSON. I and II?

Admiral HOLLAND. Yes, in accordance with the President's decision.

Senator JACKSON. So we are still confined to those numbers?

Admiral HOLLAND. 656 submarine tubes. Our only outlet from that, there is a corollary to their agreement, which says that the older Titan systems when they are dismantled can be turned into submarine launchers, so we get an extra 56 tubes out there if we dismantle Titan launchers.

Senator JACKSON. That would give us what?

Admiral HOLLAND. 710.

Senator JACKSON. That would be two more Tridents plus six over?

Admiral HOLLAND. Yes.

Senator JACKSON. How many launchers have the Soviets deployed in the form of their strategic subs, do you know what those numbers are? We can get it for the record. I wonder if they are up to the limit of 900 plus. Those are not cruise missiles, but ballistic missile firing submarines.

Admiral HOLLAND. I will have to get it for the record. I don't have the total.

[The information follows:]

SOVIET SLBM LAUNCHER LIMIT

The Soviets [deleted] SLBM launchers on 62 SSBN's.

Admiral KELSO. I assume they are because [deleted].

SEA-BASED VERSUS LAND-BASED MISSILE COMMONALITY

Senator WARNER. I have a couple of questions here.

I am still concerned. We must have a tight record on this commonality issue. There are distinct characteristics between the desirable sea-based missile and a desirable land-based missile, are there not?

Admiral CLARKE. Yes.

Senator WARNER. Taken the likelihood of everything—commonality to serve both missions are degradation of both potentials.

Admiral CLARKE. When they make them common, you compromise both of them.

Senator WARNER. If we were to go to such a common missile, we would end up with a Trident submarine, the bottom itself, far larger than is necessary to carry one of our common missiles, in all probability.

Admiral CLARKE. We would make the common missile compatible with the Trident submarine.

Senator WARNER. But in that system, you end up with a monster on land.

Admiral CLARK. For mobility purposes.

Senator WARNER. And for more than you probably need for a single warhead which is the mission now being characterized.

Admiral CLARK. For a single small warhead.

Senator WARNER. Now there is a substantial technology transfer in that sense, there is commonality between the two.

Admiral CLARK. That is right.

Senator WARNER. In a briefing by the Strategic Air Command last week, members of this committee, Senator Nunn, raised a very interesting point concerning one of the assumptions made in the Strategic Command scenario game plan.

In this scenario it was postulated that in the generated case, [deleted].

In other words, once we went into that system they could [deleted].

Would you describe our actual planning or monitoring, [deleted].

Admiral HOLLAND. I am not quite sure I understand the scenario, in a generated case, has a launch occurred?

Senator WARNER. Yes, a first strike.

Admiral HOLLAND. Then presumably there is a national decision which executes the war plans?

Senator WARNER. Yes.

Admiral HOLLAND. And that is released and communicated to the forces in some fashion [deleted].

Mr. GAFFNEY. The scenario that was portrayed was in effect [deleted]

Senator WARNER. We will put this one in the record because this ought to take a little study and then we have a question of classification based on that.

Admiral HOLLAND. It is a simple question to answer, I think. The question is, it is a political question and it would depend upon what political decisions are made in the United States as to the determination of the rules of engagement.

Senator WARNER. Here it is the scenario. Under that situation, [deleted].

Admiral HOLLAND. I am familiar with the analysis that was made. We support that and we do the same analysis in the Joint Chiefs of Staff. We intentionally do not, in the gaming, take ASW into account or any post-exchange attrition of other forces. The purpose of the analysis is to create the most stressful situation on both sides in order to demonstrate, examine the forces, so there is no reduction in the force capability by other forces.

For example, not only is there no ASW in that scenario, but there are no theater weapons. There is no conventional force of any kind in the analysis, the analysis is strictly an exchange of the strategic weapons.

Senator WARNER. Then how representative of a true situation is it?

Admiral HOLLAND. It is not representative of a true situation, it is done only to determine, to try to determine and display the capabilities of the various systems in order that they can be analyzed for programmatic purposes.

Senator WARNER. Has anyone run a scenario where there are allowances for attrition and on both sides after the initial strike?

Admiral HOLLAND. Yes.

Senator WARNER. We will have to get those before the committee, then.

Admiral HOLLAND. Well, those games are run for the purposes of training and education of ourselves, they are war games and they are not analytical games as the particular RISOP-SIOP exchange game is conducted. That is an analytical game as opposed to a war educational game. I am not sure we have an analytical game which does what you want it to do.

In other words, display World War III in all of its ramifications.

SEA-LAUNCH SITUATION

Senator WARNER. Now, Admiral Hostettler, we will return to your sea launch situation.

What assurance can you give the committee that the control problems at G. D. Convair have now been rectified, and what confidence should the committee have that [deleted] are under control, and is there any performance warranty on the part of G. E. or Markey, outlined in terms of that contract?

Admiral HOSTETTLER. I didn't catch the last part of your question, Senator.

Senator WARNER. Is there any performance warranty under that contract by G. E. or Markey?

Admiral HOSTETTLER. To begin with, we have been busily engaged at both contractors, and principally General Dynamics, who is our prime assembler of all the Tomahawk Variants we started last August, to completely reset the entire production process including quality assurance.

Second, we have stressed the missile in the normal test sense through that process. We have increased the amount of vibration through test with the total, to try to get it to break. Also we have added new screening processes to insure that certain problems that we have had in the past do not get screened out through the door.

I will tell you that as of today that process is not complete. We understand now what needs to be done. It is during that process, the changeover, for instance, that much of the production on the assembly line is being redone. All of the Q&A assemblies have already been redone, and each piece part is being reviewed to insure that it is in fact being produced in accordance with specifications.

The point I make here is it is not something we are going to do overnight, but something that I believe will be done prior to going to production.

It is my personal belief that we should be ready at General Dynamics to produce a good. all-around production by August of this year, and not before. In the interim we will retain a low-rate production, the number required to insure we understand how to get to rate production, and the minimum required to do the essential test evaluation as well as make deliveries of our high-priority GLCM program to England and Italy. There will be no extra missiles at all.

I am convinced we can make it. I am also convinced we have a lot of work to do between now and then, sir.

TRIDENT PROGRAM

Senator WARNER. Let us return to the Trident program.

There is a growing sensitivity in Congress about this incremental funding of Naval vessels. Has the funding approach adopted with respect to the 11 Trident submarines as a result of congressional action in the 1983 authorization bill, in effect constituted an incremental funding of this vessel? Is that true?

Admiral KELSO. The 11th ship, that is a fully funded ship.

Senator WARNER. Perhaps it is the 10th ship?

Admiral KELSO. The ninth ship was fully funded when it was authorized and appropriated as a C–4 ship. Last summer the Navy made a change in how we were going to introduce the D–5 missile into that program and that left us a contract, for the 1981 ship, and not enough money in that contract to put the D–5 on it. We then had to make up the difference in the first available year to do that. We tried in 1983 and some of that money was reduced in the appropriations process and that money is now fully funded in the 1984 budget to cover the 1981 ship as a D–5 ship.

So, the first budget that came to the Hill subsequent, the Navy followed the full funding program and DOD approved it, to make it fully funded as a D–5 ship.

Senator WARNER. 1981 is now fully funded?

Admiral KELSO. The 1981 ship will be fully funded in the 1984 budget if it is approved.

Senator WARNER. And then the two subsequent are fully funded?

Admiral KELSO. The 10th ship funded in 1983 is fully funded, as a D–5, and for the ship in 1984, we are asking for full funding for that ship.

Senator WARNER. Do we call them ships or boats now?

Admiral KELSO. Most of us have called them boats, but they are technically ships, Senator.

SUBMARINE SANCTUARIES

Senator WARNER. Would you comment at this time on what the Navy's views are with respect to establishing submarine sanctuaries as an arms-control measure?

Admiral HOLLAND. We don't support such a position.

Senator WARNER. So you prefer not to have any sanctuaries on either side?

Admiral HOLLAND. Yes, sir.

Senator WARNER. Well, now, let us take a look. One of the most tensely damaging things in any scenario is the offshore SLCM launch ability of the Soviets. And the SLBM also.

Admiral HOLLAND. But they can launch those SLBM's far away. If the question comes as to the weight of metal that can be provided by a SLCM launch, if you are going to launch SLCM at the United States from the Soviet Union, probably they are going to launch others as well, and the SLCM weapons will have very low destructive potential as compared to the other missiles.

So it doesn't appear to be any advantage to the United States to have sanctuaries. If the Soviets decided he was going to attack the United States with a SLCM launch system, I don't believe any treaty creating sanctuaries would protect us.

It doesn't seem to the Navy that there is any particular utility to that line because there is no way to verify that sanctuaries are in fact being observed.

Mr. GAFFNEY. The second point might be an alternative approach, keep out sensor exclusion, and not simply being relatively short-range sea launch cruise missiles, but the postulated threat from a very short flight time or trajectory attack on CONUS itself if they develop that capability, and that is to keep them out of coastal waters.

Is that a desirable tradeoff?

Admiral HOLLAND. In regard to the reduction of the flight time for a weapon attacking command and control, that might be fertile terrain if you could guarantee that the Soviets would observe such a treaty after they decided to start a war. I am not sure how you guarantee after starting a war that they would live up to a treaty.

Therefore, we don't really gain anything particularly substantial.

Senator WARNER. Senator Thurmond, we just about concluded this hearing and the chairman was late this morning by 15 minutes and I apologize to all of you.

Senator Goldwater, being his usual punctual self, started the hearing at 8:03.

Do you have any particular questions for these gentlemen?

Senator THURMOND. I don't have any questions. I will read the testimony to see what you gentlemen had to say.

I am glad to have you with us. The only thing I want to say is that I urge you to stand firm. I think this country is in a critical situation throughout the world today and we have to maintain a strong defense and we have to let the world know we have got it.

That is all I have to say.

Senator WARNER. Thank you very much, gentlemen.

[Questions submitted by Senate Armed Services' Strategic and Theater Nuclear Warfare Subcommittee to be answered for the record follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN W. WARNER

SLBM PROMPTNESS

Senator WARNER. Admiral Holland, what are the factors which preclude the SLBM force as currently configured from performing a prompt retaliatory mission? Once the D-5 system is introduced, what considerations would be involved in a decision to increase the promptness of the hard-target kill capability which could then reside in the fleet ballistic missile force?

Admiral HOLLAND. Promptness, as a positive attribute of strategic offensive systems, has never been precisely defined. The capability of current SLBM forces to perform a prompt retaliatory mission is therefore not clearly precluded. A requirement for promptness could arise, first, from the targeting task assigned,

or, second, from a requirement to utilize weapons before they would be threatened by enemy action. With regard to the first definition, the destruction of enemy missiles in their silos, the negation of command and control capability, or the destruction of mobile targets are examples of tasks that require promptness of execution to achieve the desired effect. The time of flight required by all strategic ballistic missiles, both SLBM's and ICBM's, is sufficiently long to render them ineffective in the performance of such targeting tasks. With regard to the second definition, because SSBNs are invulnerable to enemy detection while at sea, promptness in their execution is not required for the preservation of their survivability.

Other requirements for promptness are less stringent, and are well within the capability of our current sea-based systems. The primary weakness in those systems is, of course, their lack of hard-target capability. That deficiency will be corrected upon the deployment of D–5. The promptness with which D–5's improved capability must be executed would then depend almost entirely on the nature of the specific targets to be attacked. Should a requirement for faster response be defined at some time in the future, the variable factor to be addressed would be the rapidity with which delivery of an execution message could be assured.

SOVIET AWARENESS OF SOSUS

Senator WARNER. Admiral Kelso, to what degree are we aware of Soviet efforts to locate, monitor and/or interrupt our SOSUS system? Are they assessed to have reasonably good data as to the whereabouts of the SOSUS systems component parts and to understand reasonably well the operating areas in which the movements are most readily monitored by the United States?

Admiral KELSO. We believe that the [deleted].

[Deleted.]

Senator WARNER. Admiral Holland, I understand that the intelligence community believes that the Soviets may be [deleted]. What would the appearance of such a capability in numbers mean to the ability of [deleted] assets to perform their missions? Is a comparable capability being currently considered for the U.S. submarine force?

Admiral HOLLAND. An effective [deleted] capability deployed in numbers on Soviet submarines would be of significant concern [deleted].

ASW TECHNOLOGY

Senator WARNER. Admiral Kelso, it would be extremely helpful to the subcommittee if you would describe now and in greater detail for the classified record our estimates of Soviet activities with respect to a range of "unconventional" anti-submarine warfare technology. In particular, what assessment do we make of Soviet [deleted].

Admiral KELSO. The Soviet Navy is pursuing a broad range of research and development efforts in submarine detection phenomena. Although this Soviet non-acoustic research [deleted].

Recognizing the inability to obtain complete and timely intelligence on Soviet research, we established the SSBN security program to conduct research on submarine detection technology. Thus, our assessment is based on physics as well as intelligence. Within the SSBN security program, non-acoustic detection phenomena have been carefully evaluated. Magnetic anomoly detection (MAD), even with all factors optimized, is only a sensor for short-range localization. Submarine-generated hydrodynamic surface effects have been the subject of extensive investigation.

[Deleted.]

The U.S. SSBN security program is a formal and carefully structured program to continuously evaluate all real and postulated threats and develop countermeasures. This long-range program is designed to prevent the U.S. from being caught unaware by a future Soviet ASW technological breakthrough. [Deleted.]

STABILIZING/DESTABILIZING EFFECT OF D–5

Senator WARNER. Admiral Holland, as you are aware, some of my colleagues in the Congress are persuaded that the deployment of a hard-target kill-capable missile in a relatively invulnerable basing system—one which can execute an attack in the short flight times possible with SLBM systems—would have a destabilizing influence on the strategic balance. Would you comment?

Admiral HOLLAND. I believe stability should be viewed from two aspects: First, stability in a crisis or during periods of increased tension, and second, arms control stability.

From a crisis stability aspect, a weapon system should be examined as to whether or not its existence increases or decreases incentive to use nuclear weapons. At-sea SLBMs enjoy an invulnerable basing mode and are not subject to attack by enemy strategic forces; this essentially eliminates pressures to "use or lose" the system. From the Soviet viewpoint, there is little incentive to attack invulnerable systems since such an attack would equate to unilateral disarmament. Further, if the United States were attempting to achieve a first strike capability with hard target kill capable missiles, it would make little sense to spend the extra dollars required to make the system invulnerable; cheaper, vulnerable systems are totally satisfactory for first strike use.

From an arms control aspect, it is desirable to deploy systems whose survivability and effectiveness are decoupled from either qualitative or quantitative improvements in enemy strategic systems. An invulnerable basing mode will achieve this. If these systems are given a hard target kill capability which can threaten Soviet forces, they provide incentives for the Soviets to shift to a more survivable basing mode. With both sides so postured, significant reduction in strategic arms should be possible since neither has to build to compensate for vulnerability.

In my view, a hard target kill capable missile in an invulnerable basing mode will enhance stability.

EXCLUSION ZONES FOR SUBMARINES

Senator WARNER. Admiral Holland, would you elaborate for the record the Navy view of an arms control proposal which would provide exclusion zones for Soviet submarines in U.S. coastal waters and vice versa? How would you feel if some provision were to be applied that stipulated that a breach of such an agreement in peacetime could be grounds for use of deadly force against the offending submarine? What practical, policy, and political problems do you see with such a proposal?

Admiral HOLLAND. An agreement to establish submarine exclusion zones not only poses major verification problems but also would not improve the security of either nation. Because of the inherent covert nature of modern submarine operations, it would be difficult to monitor compliance. Furthermore, an exclusion zone would have little practical effect because the range capabilities of current submarine-launched ballistic missiles diminishes the need for submerged operations in coastal waters.

The use of deadly force against a possible submerged contact thought to be in violation of a submarine exclusion zone in peacetime could have serious complications. Even if the nationality of the suspect submarine could be determined with certainty (and it is doubtful that such is likely) an attack with deadly force in international waters is a most serious step and could result in an escalation of international tension beyond the national interest. Navigation errors, engineering casualties and a variety of other operational factors could accidentally place a submarine of any nation in unintended location.

Submarine exclusion zones would also establish an undesirable precedent with respect to the long-standing U.S. position concerning freedom of navigation in international waters. Such a policy reversal could generate considerable negative impact in many areas of immediate interest to the U.S. as a maritime nation, such as national territorial limits, sea-based mineral rights, and rights of innocent passage.

SSBN SECURITY

Senator WARNER. Admiral Holland, you testified that the Soviets interest would lie in keeping the oceans opaque—so that their subs would survive—and that, therefore, they would not try to make them transparent with respect to our subs.

Are the two purposes necessarily at odds? Couldn't they seek to try to locate our subs even as they endeavor to make theirs harder to detect?

Do you mean to suggest that they are not working at detecting, finding and targeting our SSBN's?

Admiral HOLLAND. There is no conflict of interest in trying to keep one's own submarine undetected while trying to find the other side's submarines. [Deleted.]

The physics controlling the detection of submarines also controls the security of submarines. Our submarine detection research programs are closely coordinated to address both ASW and SSBN security. [Deleted.]

BLUE-GREEN SUBMARINE LASER

Senator WARNER. Last week the subcommittee heard testimony from the Vice Admiral Gordon Nagler in which he indicated that the introduction of a Blue-Green submarine laser communications system appeared to be unattractive due to the other means of performing the same function which should be available in the same time-frame and the costs associated with the Blue-Green system. Do you agree? From the operational commander's point of view, how high a priority do you attach to obtaining the performance characteristics advertised for a Blue-Green laser system?

Admiral KELSO. I agree with Vice Admiral Nagler that a Blue-Green laser communication system is less attractive than other systems which would perform the same submarine broadcast function. I consider it extremely important to keep our submarines covert and survivable. A system which would penetrate sea water to significant depths would enhance the submarines security by reducing the time needed for the submarine to spend close to the surface. For submarine broadcasts both Blue-Green and ELF (Extremely Low Frequency) have the characteristic that they can penetrate deeply below the surface of the sea. ELF is a proven commodity and has an IOC of 1985. Current Blue-Green research indicates that the system is a high-risk, high-cost technology that will not be available until the late 1990's. Even then it will be a low data rate system because the need for covertness will force it to sweep large areas reducing the reception time available per submarine. I consider that implementing systems to improve our submarine security and survivability should have a very high priority. On the other hand, I believe that current technology, such as ELF, is a preferable substitute for the potential of systems such as satellite Blue-Green laser communications.

EFFECT OF DROPPING OUT ONE TRIDENT SUB IN FISCAL YEAR 1983

Senator WARNER. Admiral Kelso, would you describe the impact upon the Trident shipbuilding program that has been felt by the congressional decision to eliminate the 2nd Trident submarine from the fiscal year 1983 budget? What about the impact on Electric Boat? Are we risking a return to the problems of the 1970's there?

Admiral KELSO. The decision to eliminate the second fiscal year 1983 *Ohio* class ship will delay delivery of later ships up to one year from the dates they could have been delivered.

With regard to Electric Boat, eliminating the second fiscal year 1983 ship causes a moderate reduction in outyear workload. Based on current performance, I do not foresee a return to problems of the 1970's.

NAVY RESPONSE TO GAO REPORT RE TRIDENT SUB CONSTRUCTION PROBLEMS

Senator WARNER. Admiral Kelso, would you respond now, and in greater detail for the record, to the recent report by the General Accounting Office concerning construction problems associated with Trident submarine construction at Electric Boat? Has the delay imposed on delivery of the Trident submarines configured for D–5 increased since this issue was addressed by the Congress last year?

Admiral KELSO. Currently there are no significant construction problems at Electric Boat. The February 1983 GAO report describes the situation at Electric Boat as "stable", and the working relationship with Electric Boat continues to improve.

The delivery extensions required on the 9th and 10th ship to install Trident II are still estimated to be 12 months.

OPERATIONAL EXPERIENCE WITH THE ELF SYSTEM

Senator WARNER. Admiral Kelso, last week Vice Admiral Gordon Nagler indicated that the Navy had begun conducting tests of the Extremely Low Frequency (ELF) system using test receivers aboard several attack submarines and the U.S.S. *Ohio*. Would you describe the performance of the system as it has been

assessed to date, and the degree to which the submarine community believes that such capability will add to the flexibility and survivability of the SSBN force?

Admiral KELSO. The performance of the ELF system in tests aboard our submarines has been excellent. These test installations have confirmed ELF performance predictions which provide the receiving submarine an increased speed and depth envelope in which to operate and continue to receive communications from shore commanders. Our experience has also clearly demonstrated a significant increase in communication flexibility [deleted.]

[Deleted.]

An important factor to consider is that with present day communications, submarines are often forced to operate at depths and speeds that are not optimum. Historically, even as far back as World War II, our experience has shown that a submarine operating in the upper reaches of the ocean is easier to detect and attack than is a submarine that has the flexibility to operate outside sound propagation channels and to take maximum advantage of thermal gradients. The expanded ELF communications provides this capability [deleted].

SOVIET QUIETING ADVANCES

Senator WARNER. Admiral Kelso, would you describe the degree to which in the past years the observed level of Soviet noise reduction efforts in their strategic submarine force have altered the overall acoustic signature level of the Soviet ballistic missile force? In your judgment, how have these developments affected the ability of our attack submarine force to detect and target Soviet sea-based ballistic missile submarines?

Admiral KELSO. There is a clear trend of [deleted]. It wil be increasingly important that new U.S. submarines have more sensitive acoustic detection systems to counter continued Soviet submarine quieting.

SOVIET [DELETED] DEVELOPMENT

Senator WARNER. Admiral Kelso, Admiral Nagler testified last week that the Soviet Union appears to have under development [deleted]. Will the introduction of this system as an operational capability further alter our ability to [deleted].

Admiral KELSO. A [deleted].

SALT DRAWDOWN DUE TO FLORIDA

Senator WARNER. What is the status of our SLBM tube holdings under SALT? Have we already "paid" for the additional launchers which we are introducing with the U.S.S. *Florida*?

Admiral KELSO. When *Florida* commenced her initial sea trials in February, the U.S. had 680 SALT-accountable SLBM launchers; 3 Trident's, 31 Poseidon/Trident I Backfits, and 7 ex-Polaris SSBN. In order to reduce our launchers to the agreed upon level, two ex-Polaris submarines entered Puget Sound Naval Shipyard for dismantlement in accordance with the Strategic Arms Limitation Agreement with the USSR. The two ships were U.S.S. *R. E. Lee* (SSN 601) and U.S.S. *Thomas A. Edison* (SSN 610).

MARK 500 INTERFACE PROTECTION

Senator WARNER. How long can the option be preserved to maintain a capability to go with the Mark 500 maneuvering system, D–5 missile? What costs are associated with preserving this option over the near-term (i.e., over the next few years)?

Admiral CLARK. We can maintain the MK 500 compatibility with the D–5 weapon system for as long as desired. The costs of preserving this option would be $40–50 million per year.

TRIDENT II ACCELERATION

Senator WARNER. As you well know, chronic interest is expressed in the Congress about the possibility of accelerating the initial operational capability of the D–5 missile. Would you give us your current assessment of the possibilities of achieving a significant acceleration of the program, the costs that would be incurred and the potential risks run?

Is it your personal judgment that the current pace and level of funding for the Trident II missile is the appropriate one for the country to be pursuing at this time?

Admiral CLARK. In the spring of 1982 the question of program acceleration was studied by the Navy Research Advisory Committee (NRAC). The committee concluded that a one year acceleration in Initial Operation Capability (IOC) was feasible, but that weapons system maturity would be somewhat less at the start of production because of the one year compression of the advanced development effort. Subsequently, it was determined that the large near term cost for the 1-year acceleration could not be considered commensurate with the limited improvement in military capability which would have been achieved by acceleration of IOC. It was directed that the program continue as currently planned—not accelerated. As the engineering development phase of the accelerated program would have had to have started in October 1982, it is no longer technically feasible to accelerate the IOC of Trident II.

It is my personal judgment that the current pace and level of funding for the Trident II missile is the appropriate one for the country to be pursuing at this time.

STATUS OF THE MARK 500 PROGRAM

Senator WARNER. What is the current status of the Mark 500 maneuvering warhead program? Do you believe that the appropriate level of effort is being maintained with respect to this system? What additional funding would be required to support the maintenance of this capability in a stand-by status satisfactory to you?

Admiral CLARK. The MK 500 program is currently being brought to an orderly conclusion and funds are not requested for this program in fiscal year 1984. I would estimate that approximately $40–50 million per year would be required to maintain a readiness to deploy the MK 500 in an abbreviated period.

WARHEAD FOR THE TRIDENT II (D–5)

Senator WARNER. Why is it believed to be preferable to design a new reentry vehicle for the D–5 missile? Would you provide for the record the Department of Energy and Navy costs associated such a development effort? What would the corresponding costs be for developing a maneuvering warhead for this missile building upon the technology developed for the MK 500 warhead.

Admiral CLARK. A prime requirement in the design of the new Trident II missile is to provide an enhanced capability against the full spectrum of potential targets. A joint DOD/DOE study examined all feasible high yield warhead candidates and concluded with the recommendation that a new reentry system provides the required increase in weapon system effectiveness. The cost to the DOD to develop the new (MK 5) reentry system is estimated to be about $365 million more than the adaptation of the MK 12A. DOE costs will not be determined until completion of the Phase IIA warhead study scheduled to be completed in late 1983. The cost to develop an accurate evader with a high yield warhead, full penetration aids and which uses the MK 500 technology is estimated to be approximately $1.5 billion.

SEA LAUNCHED CRUISE MISSILE SURVIVABILITY

Senator WARNER. In view of the Air Force's decision to develop and deploy a new generation of strategic Air Launched Cruise Missiles in order to cope with the improved Soviet air defense threat of the late 1980's–1990's, has the Navy judged it necessary to incorporate modifications to or replacements of the first-generation nuclear land attack Sea Launched Cruise Missile which will be deployed aboard submarines and in box launchers aboard surface ships?

Admiral HOSTETTLER. [Deleted.]

ACQUISITION OF CRUISE MISSILE TECHNOLOGY

Senator WARNER. Last week, Secretary Richard Perle indicated to the committee that there was evidence that the Soviet Union had acquired through overt and covert means technology associated with U.S. cruise missile program which had reduced the estimated advantage in such technology enjoyed by the United States from ten years ahead of the Soviets to merely several years. Would

you comment on the evidence of such acquisition of technology by the Soviet Union and your assessment of the qualitative effect that will have on Soviet cruise missile capabilities?

Admiral HOSTETTLER. [Deleted.].

SEA LAUNCHED CRUISE MISSILE FUZING

Senator WARNER. What is the current capability of the SLCM (TLAM-N) to attack low-lying targets? What are the limiting factors in this ability and what steps are being taken to rectify our targeting abilities with the SLCM? When would the requisite fixes be in place?

Admiral HOSTETTLER. The ability of the Sea Launched Cruise Missile (SLCM), nuclear land attack version, to attack "low-lying" targets is not an issue [deleted].

QUESTIONS SUBMITTED BY SENATOR HENRY M. JACKSON

DETECTION RANGE OF SA-10 AGAINST TOMAHAWK

Senator JACKSON. Admiral Hostettler, would you furnish for the record, the estimated detection range of the SA-10 against the Tomahawk missile penetrating at altitudes of 100 feet, 200 feet, and 2,000 feet and the probability of kill given detection

Admiral HOSTETTLER. [Deleted.]

TOMAHAWK PROGRAM FUNDING

Senator JACKSON. Admiral Hostettler, would you compare through 1988, the funding levels, buys and deliveries of the current Tomahawk program with the same data for the Tomahawk program submitted to Congress in February of 1982. Please provide the buys and deliveries by type of missile. For example, TLAM(N), TLAM(C), TASM and GLCM. Also, would you include the schedule of the MRASM missile program which is implicit in the costing of the Tomahawk program.

Admiral HOSTETTLER. The attached tables present the comparison of the fiscal year 1983 and fiscal year 1984 President's budget programs for the Tomahawk. Table 1 shows the funding levels and buys and table 2 shows deliveries.

TABLE 1.—COMPARISON OF FISCAL YEARS 1983 AND 1984 PRESIDENT'S BUDGETS, TOMAHAWK PROGRAM (WPN) FISCAL YEARS 1980 THROUGH 1988

	Fiscal year—									
	1980	1981	1982	1983	1984	1985	1986	1987	1988	Total
Fiscal year 1983 President's budget										
Other cruise missile quantities: [1]										
BGM-109G [GLCM]										
AGM-86B [ALCM]										
AGM-109H/L [MRASM]										
Tomahawk:										
BGM-109A [TLAM(N)]	[Deleted.]									
BGM-109B [TLAM]										
BGM-109C [TLAM(C)]										
Total BGM-109A/B/C quantity										
Weapon system requirement [2] (in millions of dollars)										
Fiscal year 1984 President's budget										
Other cruise missile quantities: [1]										
BGM-109G [GLCM]										
AGM-86B [ALCM]										
AGM-109H/L [MRASM]										
Tomahawk:										
BGM-109A [TLAM(N)]	[Deleted.]									
BGM-109B [TASM]										
BGM-109C [TLAM(C)]										
Total BGM-109A/B/C quantity										
Weapon system requirement [2] (in millions of dollars)										

[1] Other cruise missiles implicit in costing the Tomahawk program.
[2] Weapon system requirement is total procurement (WPN) requirement less initial spares.

TABLE 2.—DELIVERIES OF CURRENT TOMAHAWK PROGRAM VS SAME DATA TO CONGRESS FEBRUARY 1982

	1980	1981	1982	1983	Fiscal year— 1984	1985	1986	1987	1988
February 1982 submit: Deliveries:									
TLAM–N, TASM, TLAM–C, GLCM	[Deleted.]								
Current program: Deliveries:									
TLAM–N, TASM, TLAM–C, GLCM	[Deleted.]								

TOMAHAWK FLIGHT TEST SUMMARY

Senator JACKSON. Admiral Hostettler, would you provide for the record the results of all of the developmental tests and operational tests of the Tomahawk missile.

Admiral HOSTETTLER. To date, there have been a total of 98 free flight tests of the Tomahawk cruise missile. The 98 tests include the 10 flights of the General Dynamics air launched cruise missile (ALCM) involved in its competition with the Boeing ALCM, eight ground launched cruise missile (GLCM) system tests and 80 sea launched cruise missile (SLCM) tests.

The flight test summary is as follows:

	Total launches	Success	Failure	No test
ALCM	10	[Deleted.]	0	0
GLCM	8		0	0
SLCM	80		1	1

The one "no test" involved a Tomahawk conventional land attack cruise missile that missed its target as a result of transferring control of missile to range safety carrier.

QUESTIONS SUBMITTED BY SENATOR SAM NUNN

COSTS OF ALTERNATE TRIDENT FORCES

Senator NUNN. I asked some questions at the October 30, 1981 hearing on the newly announced strategic modernization program and similar questions at the March 5, 1982, hearing on this same subject. I would like some updated information on these areas and answers to the following related questions:

Please provide for the record an update of the information provided on March 5, 1982, as to the number of Trident submarines needed to replace the MX missile and the cost to produce such a force. (For this analysis, the MX force should be considered to be 100 MX's in CSB.)

Please provide the same analysis for 50 MX's deployed in Minuteman silos.

Please provide the same information assuming 75 percent, 50 percent and 25 percent survivability rate for the MX.

Admiral KELSO. The following tabulations display the Trident D–5 force equivalent to the specified numbers of MX missiles. The following assumptions apply:

(1) Trident SSBN's on day-to-day alert, with two-thirds of the force at sea and survivable.

(1) D–5 and MX warhead have equivalent effectiveness.

(3) D–5 carries [deleted] RV's.

(4) MX carries [deleted] RV's.

(5) R&D and Test Missile costs proportioned on the basis of a 20–SSBN Trident force for the number of Tridents needed to substitute for the various numbers of MX missiles.

CSB (100 MX missiles):				
Survivability	1.0	0.75	0.50	0.25
No. MX missiles surviving	100	75	50	25
Equivalent inventory SSBN's	[Deleted.]			
Cost ($B)				
Minuteman silos (50 MX missiles):				
Survivability	1.0	0.75	0.50	0.25
No. MX missiles surviving	50	37.5	25	12.5
Equivalent inventory SSBN's	[Deleted.]			
Cost ($B)				

TOMAHAWK NUCLEAR-ARMED LAND ATTACK CRUISE MISSILE

Senator NUNN. What are the current plans for the nuclear-armed land attack version of the Tomahawk cruise missile? How many do you plan to purchase, when will they be deployed and what is the program cost? How will these systems be integrated into our overall nuclear weapons planning and what do you envision as their primary purpose?

Admiral HOSTETTLER. Programed procurement in fiscal year 1982 through fiscal year 1990 is for a total of [deleted] missiles for the Sea Launched nuclear-armed land attack version and [deleted] missiles for the Ground Launched Cruise Missile.

Initial Operational Capability for the Sea Launched nuclear-armed land attack version is June 1984. Subsequent deployment will be as ships and submarines become available in accordance with conversion/construction schedules fiscal year 1984–fiscal year 1993 and beyond. Initial Operational Capability at the GLCM Main Operating Base Number 1 will be December 1983. Subsequent missile deployment to the Main Operating Bases, Number Two through Six will be made as missiles become available fiscal year 1984–fiscal year 1989.

The Tomahawk nuclear-armed land attack weapon system required funding implicit in the fiscal year 1984 President's Budget program is $1.544 billion for the Sea Launched version and $3.595 billion for the Ground Launched version.

TLAM–N is viewed as a non strategic nuclear force weapon which will contribute to the nuclear reserve force.

SSBN ALERT RATE

Senator NUNN. To what extent can we increase the SSBN alert rate (by increasing length of time between overhaul and/or by shortening the refit cycle) to improve the number of weapons that can be delivered in the SIOP from the sea-based leg? What are the costs and operational considerations?

Admiral KELSO. Over the past several years the Navy has studied means by which SSBNs can spend a greater amount of time in their strategic role and less in overhauls. Within the past 6 months the decision was made to increase the interval between overhauls from Poseidon SSBNs from a maximum of 9 years to 12 years. [Deleted.] In order to attain this interval it is essential that existing refit/patrol cycles be maintained. The careful monitoring and repair work during the refit periods and the workup and training which follow (together 32 days out of each 100) insure that the SSBN can remain on station for the entire patrol period. It would be imprudent to reduce existing refit periods. However, with a minimal amount of strategic warning (about 24 hours) we could greatly increase SSBN forces at sea by sailing those ships in refit.

D–5 MISSILE INSTALLATION IN TRIDENT SSBN'S

Senator NUNN. What are the current plans for outfitting the Trident submarine with the D–5 missile? When will the first Trident be backfitted with the D–5 and which hull will this be? What is the testing schedule for the D–5 from the submarine? What is the actual production missile schedule for the D–5 as well as the test missile production for the D–5?

Admiral KELSO. The Trident II D–5 missile system will be installed during new construction commencing with the fiscal year 1981 ship (ninth hull), and in all new construction Trident submarines thereafter.

The first Trident submarine to be backfitted with the D–5 missile system will be the lead ship of the class, the U.S.S. *Ohio* (SSBN 726), during her first overhaul scheduled to begin in 1991.

The first ship-launched D–5 missile flight tests, called Performance Evaluation Missile (PEM) flights, will be conducted from the ninth Trident hull during the spring and summer of 1989.

D–5 missile production will commence in early 1987 with 27 missiles planned in fiscal year 1987 and 72 missiles per year in fiscal year 1988 through fiscal year 1992. Test missiles for development flight tests will be built during the full scale engineering development phase in time to support the first development flight tests in early 1987.

Questions Submitted by Senator Carl Levin

SSBN SECURITY

Senator Levin. Back in 1979 Dr. Perry, who was then the Under Secretary of Defense, told this subcommittee that he did not project that the Soviets would be able to develop a system to localize our SSBNs during the decade of the 1980's. Dr. David Mann, who was the Assistant Secretary of the Navy for Research and Engineering, agreed with Dr. Perry's assessment of the Soviet ASW development and even went further by stating: "Yes, I agree with it, provided there is no implication that in the 1990's that they will develop such a capability."

When I asked Dr. Mann, "No earlier than the 1990's?" he responded: "No earlier than that, yes."

Admiral Kelso, have there been any developments in the Soviet threat to our missile submarines to change this assessment?

Admiral Kelso. We continue to concur with the assessment [deleted] which concludes that Soviet forces are not now an effective counter to U.S. SSBN's and that at least through the next decade virtually all SSBNs on patrol would be able to launch their missiles. Incremental improvements in Soviet acoustic and non-acoustic sensors are projected which could improve Soviet anti-submarine warfare (ASW) capabilities. Soviet sensor research could eventually provide some level of effectiveness against our current nuclear submarines. Our plans to counter this possible increased effectiveness include the deployment of the Trident submarine and the Trident missile. The longer range Trident missile will permit operation of our submarines in more than ten times the present patrol area size thus increasing Soviet search areas significantly. The Trident submarine incorporates [deleted] to reduce detection and complicate search by advanced sensors.

[Deleted] as potential threats become identified. Advances incorporated into the Trident weapons system will provide increased flexibility in the range of available patrol depths and speeds.

[Deleted.] Our SSBN Security program and the improvements in survivability we have put into our submarines and weapons systems are expected to provide sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force.

SOVIET THREAT TO OUR SUBMARINES

Senator Levin. Each year I ask the Navy's top admirals, the Chief of Naval Operations, assistant secretaries, and everybody else I can get my hands on the following question: "Since your appearance before the committee last year, has there been any change in the Soviet threat to our strategic ballistic missile submarines in terms of greatly improved Soviet antisubmarine warfare capabilities?"

Admiral Kelso. We continue to believe that Soviet forces are not now an effective counter to U.S. SSBN's and that at least through the next decade virtually all SSBN's on patrol would be able to launch their missiles. Incremental improvements in Soviet acoustic and non-acoustic sensors are projected which could improve Soviet anti-submarine warfare (ASW) capabilities. Soviet sensor research could eventually provide some level of effectiveness against our current nuclear submarines. Our plans to counter this possible improve effectiveness include the deployment of the Trident submarine and the Trident missile. The longer range Trident missile will permit operation of our submarines in more than ten times the present patrol area size thus increasing Soviet search areas significantly. The Trident submarine incorporates [deleted] to reduce detection and complicate search by advanced sensors.

[Deleted] as potential threats become identified. Advances incorporated into the Trident weapons system will provide increased flexibility in the range of available patrol depths and speeds.

[Deleted.] Our SSBN security program and the improvements in survivability we have put into our submarines and weapons systems are expected to provide

sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force.

Senator LEVIN. Does the Navy still consider our missile submarines to be invulnerable against the Soviet threat at the present time, and does the Navy still expect that the submarines shall still remain invulnerable against the Soviet ASW threat at least until the end of this decade?

Admiral KELSO. We continue to believe that Soviet forces are not now an effective counter to U.S. SSBN's and that at least through the next decade virtually all SSBN's on patrol would be able to launch their missiles. Incremental improvements in Soviet acoustic and non-acoustic sensors are projected which could improve Soviet anti-submarine warfare (ASW) capabilities. Soviet sensor research could eventually provide some level of effectiveness against our current nuclear submarines. Our plans to counter this possible increased effectiveness include the deployment of the Trident submarine and the Trident missile. The longer range Trident missile will permit operation of our submarines in more than ten times the present patrol area size thus increasing Soviet search areas significantly. The Trident submarine incorporates [deleted] to reduce detection and complicate search by advanced sensors. [Deleted] as potential threats become identified. [Deleted.] Our SSBN Security program and the improvements in survivability we have put into our submarines and weapons systems are expected to provide sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force.

Senator LEVIN. In February 1981, in response to my question the CNO responded as follows: "There has been no change in our assessment of the Soviet threat to our strategic missile submarines. We continue to believe that Soviet antisubmarine warfare forces are not now an effective counter to U.S. SSBN's. We believe that Soviet ASW capabilities will improve, but that introduction of the Trident missile and Trident submarine with the correspondingly expanded operating areas and improved acoustic quieting will provide continued survivability."

"We believe the Soviets have little prospect of developing new systems capable of effectively detecting and tracking U.S. submarines in broad ocean areas in the foreseeable future."

Do you agree with that statement?

Admiral KELSO. We continue to conclude that Soviet forces are not now an effective counter to U.S. SSBNs and that at least through the next decade virtually all SSBNs on patrol would be able to launch their missiles. These estimates are founded on the continuing ability of our SSBN forces to maintain their security advantage through aggressive development of countermeasures.

ANTISUBMARINE WARFARE

Senator LEVIN. In 1981, Admiral Carter, head of the Navy's Strategic and Nuclear Warfare Division, testified that "antisubmarine warfare is a war of attrition. Given a capability it takes time, weeks or months, to detect and localize any significant portion of a submarine force."

I then asked him:

Would you agree that, despite the expenditure of billions of dollars the Russians have made in past decades to improve their ASW capabilities, they have failed to develop a detection and localization capability required to successfully attack and destroy our strategic missile submarines?

He responded: "Yes, sir, I believe that is true."

Would you agree that is true?

Admiral KELSO. Soviet ASW forces will continue to grow in capability .To date, [deleted]. Non-acoustic sensors such as magnetic anomaly detectors (MAD) are used for search of small, well-defined areas, [deleted]. As we look forward, we should expect an increasing Soviet ASW effort. Historically, the more forces devoted to ASW, the more effective the capability. The continued increase in Soviet ASW forces will undoubtedly result in some overall improvement in ASW capability. Our SSBN Security Program and the improvements in survivability we have put into our submarines and weapons systems are expected to provide sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force.

Senator LEVIN. Do your statements that you have just made or agreed to about Soviet efforts to develop detection and localization capabilities required to suc-

cessfully attack and destroy our strategic missile submarines apply both to Soviet efforts in acoustic and nonacoustic ASW detection?

Admiral KELSO. Yes, we believe that, for the forseeable future, the Soviets have little prospect of developing new systems capable of effectively detecting and tracking U.S. submarines in broad ocean areas. Incremental improvements in Soviet acoustic and non-acoustic sensors are projected which could improve Soviet anti-submarine warfare (ASW) capabilities. Soviet sensor research could eventually provide some level of effectiveness against our current nuclear submarines. Our plans to counter this possible increased effectiveness include the deployment of the Trident submarine and the Trident missile. The longer range Trident missile will permit operation of our submarines in more than ten times the present patrol area size thus increasing Soviet search areas significantly. The Trident submarine incorporates [deleted] to reduce detection and complicate search by advanced sensors. The larger Trident submarine also permits installation [deleted] as potential threats become identified. Advances incorporated into the Trident weapons system will provide increased flexibility in [deleted]. Our SSBN security program and the improvements in survivability we have put into our submarines and weapons systems are expected to provide sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force.

Senator LEVIN. Our Navy believes our strategic ballistic missile submarine force "is essentially invulnerable today and will remain so for the foreseeable future," according to Admiral Holland, its strategic warfare chief. In fact, the Admiral's statement continues "indeed, to my knowledge, there has been no responsible serious challenge made to this view. We are confident that the Trident system will continue to provide this invulnerable element over the life of the system."

Since the service life projected for the Trident system is at least 30 years, would you agree that our strategic missile submarine force will remain "still survivable and highly capable," as Secretary Weinberger said, for at least the next 30 years?

Admiral KELSO. We continue to believe that Soviets ASW forces are not now an effective counter to U.S. SSBN's. This assessment is based on the continuing aggressive development and deployment of improved systems, such as the Trident missile and the Trident submarine [deleted] to maintain this security advantage. [Deleted.]

Senator LEVIN. Is it fair to say that we are considerably better at ASW than the Russians? Even though we are much better at ASW than the Soviets, we find it extremely difficult to detect our own strategic ballistic missile submarines under normal patrol circumstances, and especially when our SSBN's try to evade our own ASW forces, is that not so? There actually have been very few detections by our own forces of our own SSEN's under normal conditions, is that not so?

Admiral KELSO. It is true that [deleted]. It is also true that our ASW forces have difficulty in detecting our SSBN's and that we have more success finding Soviet submarines than finding our own. [Deleted.] However, this margin is fragile, and when faced with projected quantitative and qualitative improvements by the Soviets, it is not prudent to specify our advantage in terms of a specific time interval. Only aggressive deployment of improved systems, such as the Trident missile and improved acoustic quieting can ensure a continuing security advantage. [Deleted.]

We should expect an increasing Soviet ASW effort. Historically, the more forces devoted to ASW, the more effective the capability and the continued increase in Soviet ASW forces will undoubtedly result in an overall increase in ASW capability.

Senator LEVIN. Is it accurate to say that U.S. strategic submarines have an outstanding ability [deleted].

Why?

Admiral KELSO. The success of U.S. submarines [deleted]. Continuing priority U.S. efforts in both quieting and sonar development will be necessary to maintain a U.S. acoustic advantage.

Senator LEVIN. Are not U.S. SSBN/SSN sonar systems more capable than Soviet sonars? Are not Soviet submarine noise levels, acoustic signatures, higher than those of U.S. SSBN's? Do not these two factors provide U.S. submarines a significant relative adavntage over Soviet submarines? Please provide relative data to compare in these areas.

Admiral KELSO. Current U.S. submarine [deleted]. Future developments can be expected to result in a narrowing of U.S. and Soviet capabilities and a reduction in the current sonar advantage. Continuing priority U.S. efforts in both quieting and sonar development will be necessary to maintain a U.S. acoustic advantage.

Senator LEVIN. Is it not true that DOD/Navy has many programs underway to enhance SSBN survivability, such as developing methods of reducing SSBN detection, including conducting a noise reduction program to lower SSBN-generated noise? Is it not true that SSBN-generated noise of the existing fleet has been and is being reduced?

Admiral KELSO. The Navy has numerous priority programs to continue to maintain U.S. submarine survivability. These include: submarine quieting, which has resulted in [deleted] and longer range missiles to permit operation in larger ocean areas thus diluting any submarine detection effort.

Senator LEVIN. Three years ago I asked Dr. Perry about Soviet capabilities to simultaneously attack all our SSBN's on patrol. I stated that for such a threat to mean anything as far as degrading the nuclear deterrent of our SSBN's, the Soviets would have to be able to strike them all at once. Dr. Perry responded:

"Basically what you say is correct, it would have to be a simultaneous attack on the submarines for the Soviets to have any confidence in the success of their attack.

"I do not want to dramatize this point and suggest that they have this capability or that it would be easy for them to achieve it. It is an enormously difficult technical problem even to detect one submarine at sea, much less detect the whole fleet, discriminate the submarines from all the other things in the area and have high confidence in an attack. This is an extraordinarily difficult task."

Would you agree, Admiral Kelso?

Admiral KELSO. Dr. Perry's hypothetical example assumed [deleted].

Senator LEVIN. I continued: "How much warning would we have if they proceeded on that path?" He said: "It depends very much on how they would proceed, but in all of the ways I can think of now that you would proceed on that problem it would be a very visible program."

Admiral, would you agree it would be a "visible program," thus giving us years of warning time? We would have this warning as to the extent to which they might be achieving that capability, would we not?

Admiral KELSO. The Soviets have [deleted]. As with any Soviet classified research it is not feasible to totally understand the details and status of this research. Faced with projected potential quanitative and qualitative submarine detection improvements by the Soviets, it is not prudent to specify our advantage in terms of a specified time interval. Only aggressive deployment of improved systems, such as the Trident missile and Trident submarines with their improved acoustic quieting, can ensure a continuing security advantage. [Deleted]

Senator LEVIN. Dr. Perry in part described the increased Soviet ASW problem caused by our SSBN's now deploying with longer-range Trident missiles.

"Moreover, that ocean area that they have to search, instead of being close to the Soviet Union and therefore accessible, for example, to airplane patrols and antisubmarine surface ships, is now located in areas of the Atlantic and Pacific such that it would be extraordinarily difficult for them to deploy their resources to these areas. This is therefore an enormous improvement. I would say it is easily an order of magnitude, that is a factor of ten, increase in difficulty for whatever antisubmarine warfare program the Soviets have."

You would agree with this as still being true, despite passage of three years?

This difficulty is even worse when the even longer range Trident II comes on line, is it not?

Admiral KELSO. There has been no change in our assessment of the Soviet threat to our SSBN's. We continue to believe that Soviet ASW forces are not now an effective counter to U.S. SSBN's. This assessment is based on the continuing aggressive development and deployment of improved systems, such as the Trident missile and the Trident submarine with its extensive acoustic quieting, to maintain this security advantage. It becomes increasingly clear that effective countermeasures for potential future ASW sensors must include [deleted]. The Soviet ASW problem will be comparable with both Trident I and the Trident II missiles. [Deleted.]

Senator LEVIN. What are the documented results of U.S. antisubmarine warfare activities against our own assets? If we, with our much better systems, have

problems detecting our own SSBN's as was stated before the subcommittee, why do we think the Soviets are or would be successful?

Admiral KELSO. [Deleted.] Soviet sensor research could eventually provide some level of effectiveness against our current nuclear submarines. Our plans to counter this possible increased effectiveness include the deployment of the Trident submarine and the Trident missile. The longer range Trident missile will permit operation of our submarines in more than ten times the present patrol area size thus increasing Soviet search areas significantly. The Trident submarine incorporates [deleted] to reduce detection and complicate search by advanced sensors. The larger Trident submarine also permits installation of advanced countermeasures if future potential threats become identified. Advances incorporated into the Trident weapons system will provide increased flexibility in the range of available patrol depths and speeds. [Deleted.] Our SSBN Security Program and the improvements in survivability we have put into our submarines and weapons systems are expected to provide sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force.

Senator LEVIN. Three years ago, I asked Admiral Griffiths, then DCNO, Submarine Warfare, the following: "What is your assessment of SSBN vulnerability in the late 1980's and 1990's? Is there any reason to be cautious in deploying the Trident II missile because of growing vulnerability of the SSBN force?"

He answered: "We continue to concur with the assessment which concludes that Soviet forces are not now an effective counter to U.S. SSBN's and that at least through the next decade virtually all SSBN's on patrol would be able to launch their missiles. Incremental improvements in Soviet acoustic and nonacoustic sensors are projected which could improve Soviet antisbmarine warfare (ASW) capabilities. The projected limitations of sensors and forces, the countermeasures and counter tactics available to the United States, the general complexity of the problem and the deployment of longer range missiles with corresponding larger operating areas leads us to believe"—[deleted].

Do you agree his answer still is true?

Admiral KELSO. We continue to believe that Soviet forces are not now an effective counter to U.S. SSBN's and that at least through the next decade virtually all U.S. SSBN's on patrol would be able to launch their missiles. [Deleted.] Our SSBN Security Program and the improvements in survivability we have put into our submarines and weapons systems are expected to provide sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force.

Senator LEVIN. Admiral Griffiths in 1980 testified that it is extremely difficult for even the U.S. Navy, which has a far better capability (that I think everybody acknowledges), in ASW, than does the Soviet Union to detect our strategic missile submarines, even when they deploy existing communications such as the towed buoy antenna and the floating wire antenna. Admiral Griffiths stated that even with the floating wire antenna the success rate of U.S. ASW forces is extremely small.

I asked you, Admiral Kelso, and Admiral Carter, in 1981, "whether you would agree that these statements remain true today despite the passage of another year?" Both answers were: Admiral Carter: "Yes; I would agree with that"; Admiral Kelso: "Yes, sir; I would agree with that."

Two years later, do these statements and your agreement with them remain the same?

Admiral KELSO. Detection of floating wire antennas (FWA) or communications buoys does not represent a serious threat to the U.S. SSBN force today, but the Soviets have [deleted]. We want to stay ahead. The SSBN is too important in the deterrent equation to take for granted. The basic problem facing an opponent is how to conduct a meaningful search of the large operating areas available to the U.S. SSBN force. Again, this is looking at the system, the entire system, as a deterrent. Short range detection forces do not present a credible force-wide threat due to the very large number of platforms required and their limited time on station. SSBN's, as an overall deterrent, are very survivable. This assessment does not, however, preclude the possibility that an individual ship, constrained to operate in an unfavorable posture, might be detected.

The important factor to consider is that with present day communications, submarines are often forced to operate at depths and speeds that are not om-

timum. Historically, even as far back as World War II, our experience has shown that a submarine operating in the upper reaches of the ocean is easier to detect and attack than is a submarine that has the flexibility to operate outside sound propagation channels and to take maximum advantage of thermal gradients. [Deleted.]

Senator LEVIN. A major advantage of the Trident I missile as far as SSBN survivability is concerned is that its longer range, compared with the Poseidon missiles, gives our SSBN's more ocean in which they can hide.

Once we deploy the Trident II, which has even longer range than the Trident I missile, this will make the Soviet's ASW tasks even more difficult because of the even larger ocean areas in which our missile submarines could hide, would you not agree?

Admiral KELSO. Introduction of the Trident missile will permit operation of our submarines in more than ten times the present patrol area size thus increasing Soviet search areas significantly. For the future we must continue to pursue our SSBN Security Program and improvements in survivability for our submarines and weapons systems to provide sufficient and flexible response to future threats which might develop from Soviet research and provide for continued survivability of our SSBN force. The Soviet ASW Problem will be comparable with both the Trident I and the Trident II missiles. [Deleted.]

Senator LEVIN. Please provide for the record the number of US/allied and Soviet detections of U.S. SSBN's during the past five years, by year, compared with the number of annual patrol days. Describe whether the detections were accidental and at random, or could be attributed to any U.S. SSBN deficiency or Soviet ASW capability.

Admiral KELSO. [Deleted.] This compares with over 6,000 SSBN patrol days that U.S. SSBN's conduct per year.

[Deleted.]

[Whereupon, at 9:42 a.m., the subcommittee proceeded to other business.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1984

WEDNESDAY, MARCH 23, 1983

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC AND
THEATER NUCLEAR FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

STRATEGIC DEFENSE

The subcommittee met, in open session, pursuant to notice, at 8:15 a.m., in room SR-222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Present: Senators Warner and Nunn.

Staff present: Frank J. Gaffney, Jr., Patrick L. Renehan, professional staff members; Willis D. Smith, deputy staff director and chief scientist for the minority; Karen A. Love, staff assistant.

Also present: John Campbell, assistant to Senator Warner; Jim Dykstra, assistant to Senator Cohen; Hank Steenstra, assistant to Senator Quayle; Greg Pallas, assistant to Senator Exon; Peter Lennon, assistant to Senator Levin.

OPENING STATEMENT BY SENATOR JOHN W. WARNER, CHAIRMAN

Senator WARNER. Good morning, everybody. I apologize for being a few minutes late. We seem to work in total fits and starts in this institution.

This morning the subcommittee convenes to consider testimony from officials involved in the strategic defense of the United States.

The committee has, in recent weeks, been briefed extensively on the truly enormous commitment of resources being made by the Soviet Union to this component of their strategic forces. This hearing will attempt to assess the degree to which our current and projected strategic defense capabilities enhance our deterrent posture.

We will hear first from Gen. Louis Giuffrida, Director of the Federal Emergency Management Agency and General Stilwell, Deputy Under Secretary of Defense for Policy. General, if you will lead off, please.

STATEMENT OF LOUIS O. GIUFFRIDA, DIRECTOR, FEDERAL EMERGENCY MANAGEMENT AGENCY

General GIUFFRIDA. Thank you, Mr. Chairman. I have an oral statement which I will make. I have a statement to present for the record.

As Mr. Gaffney already explained to you, Mr. Chairman, I have a plane to catch in a little while so with your indulgence when I get close to what I feel is the deadline, I will simply move out to the back and take off.

Senator WARNER. Understood.

General GIUFFRIDA. I appreciate appearing before you to review the President's 1984 request for civil defense. As I have indicated, I have a statement for the record and a few opening remarks.

Senator WARNER. All right.

CIVIL DEFENSE

General GIUFFRIDA. Under the Civil Defense Act and Executive Order 12148, FEMA is responsible for the design and deployment of the civil defense program, with an oversight function assigned to the Secretary of Defense.

This assures that civil defense planning is "fully compatible with the Nation's overall strategic policy in order to maintain an effective link between strategic nuclear planning and the civil defense program."

Thus, FEMA manages the civil defense program and concentrates on its content and life-saving potential. The Department of Defense, by contrast, is concerned with its significance for strategic defense in the context of overall U.S. strategic policy.

I note that in the 2d session of the 97th Congress, 55 Senators—including 7 members of this subcommittee—cosponsored Senate Concurrent Resolution 133, relating to Peace Through Strength. The third principle in that resolution was to "create a strategic and civil defense which would protect the American people against nuclear war."

The President's fiscal year 1984 request for civil defense would begin the development of much improved protection for the American people. Without this enhancement we simply cannot make significant progress toward the Senate resolution's goal.

For fiscal year 1984 we are requesting $253.5 million for programs under the Civil Defense Act. This represents a $106.1 million increase over $147.4 million appropriated last year by Congress.

TITLE V AMENDMENTS TO CIVIL DEFENSE ACT

Mr. Chairman, we urge that our request be fully approved. Without this increase, FEMA cannot fulfill the mission assigned it by Congress in recent changes to the Civil Defense Act and by the President's 1982 National Security Decision Directive on Civil Defense.

The Congress, to a great degree this committee, established the precepts for the civil defense program requested in our budget. In 1980 Congress enacted a new title V to the act, stated that an improved civil defense program should be implemented to save lives, reduce crisis coercion, and enhance deterrence.

Title V further states that the program should be adaptable to help deal with peacetime disasters and emergencies. These congressional policies are virtually identical to those in the President's 1982 decision.

The Congress further amended the act in 1981 to make it very explicit that civil defense plans would be used in preparing for peacetime as well as attack-caused disasters. The statutory definition of "civil

defense" was expanded to encompass both types of disaster with the caveat that all projects should contribute to and not detract from our attack readiness.

The act also specified that people may be protected either by providing shelter at or near their homes, schools, or places of work or, if time permits, by helping them move away from threatened areas. In turn, these capabilities require a number of operational systems such as warning, emergency operating centers, and communications for the direction of lifesaving operations by civil governments, training programs, and planning for the well-being of disaster victims. These are the programs that are called for in our budget.

INTEGRATED EMERGENCY MANAGEMENT SYSTEM

Also, we are now in transition to a new program implementation strategy, the integrated emergency management system which in-house we call IEMS. IEMS is reflected in our 1984 budget request and is based upon the fact that there are common functions required in all emergency situations to protect our citizens.

These functions include planning, warning, communications, direction and control, shelter, movement of people, provision of food and of health and medical resources. IEMS meets the civil defense objectives in the President's 1982 security directive and the congressional objectives in recent amendments to the Civil Defense Act.

Also IEMS fosters a full Federal, State, and local government partnership, with provisions for flexibility at the several levels of government for achieving common readiness goals, and it builds on the foundation of existing emergency management plans, systems, and capabilities.

Actual experiences have shown that plans drawn up for one type of emergency can be used effectively in others. I would like to illustrate if I can, Mr. Chairman, with a situation that happened in Louisiana, at a place called Waterford where there is a nuclear powerplant.

The community in which the powerplant is located was required to have an evacuation plan in the event of an accident—to be prepared to move something in the vicinity of 17,000 people. At the time that the plan was being developed, skeptics doubted that the target of 7 hours for the complete evacuation could be achieved, if in fact the evacuation could be achieved at all.

In that same community is a chemical plant. There was an accident in December 1982 in the chemical plant, a real hazard of a toxic spill. It became necessary to evacuate the people. They did not use a plan that had been created for the chemical plant, they used the plan that had been created for the nuclear powerplant evacuation.

They evacuated from 5 a.m. until 7:30 a.m.—2½ hours in a downpour of rain—the entire community of almost 18,000 people. In 2½ hours, not in the 7 hours that it had been declared impossible by some of the so-called experts.

The truth is that civil defense emergency facilities and resources are used every day in coping with peacetime disasters. The national warning system warns localities of severe weather threats. Local civil defense siren systems are used to alert the people about approach-

ing tornadoes. Local officials direct lifesaving operations from the community's Emergency Operating Center during all types of crises, and emergency instructions are transmitted to the public using stations of the emergency broadcast system.

Radiological instruments and trained personnel provide support in road accidents or other emergencies involving radioactive materials—and there are many of those. Without these capabilities supported by civil defense, communities would find it much more difficult—in some cases perhaps impossible—to deal with local emergencies.

EMERGENCY MOBILIZATION PREPAREDNESS BOARD

While civil defense is most significant to State and local governments, the program also plays an important role in our national emergency preparedness efforts.

In December 1981, President Reagan established the Emergency Mobilization Preparedness Board with 23 department-level members at the Deputy or Under Secretary level. The purpose of the Board is to develop a capability to harness the mobilization potential of America in support of the Armed Forces while meeting the needs of the national economy and other civil emergency preparedness requirements. The Board is chaired by Judge Clark, the Assistant to the President for National Security Affairs.

On July 22, 1982, the President signed National Security Decision Directive 47, which states the need for an emergency mobilization preparedness capability "to meet defense and essential civilian needs during national security emergencies and major domestic emergencies."

NSDD 47 states program objectives for 12 preparedness areas including military mobilization, industrial mobilization, health, economic stabilization and public finance, civil defense, and 7 others.

There is an interagency working group for each of the 12 areas, each chaired at the Assistant Secretary level by an individual from the appropriate department or agency.

The activities of the 12 working groups are spelled out in a plan of action setting dates for specific actions which together comprise a national agenda for emergency mobilization preparedness. Civil defense is one very important facet of our national readiness posture.

The integrated emergency management system applies in this broader arena as well. FEMA's goal is to establish a single national system so that our Nation will be capable of managing emergencies across the entire spectrum—domestic emergencies, conventional war, or, if all our efforts at peace fail, nuclear war.

I would like to add that FEMA and the Department of Defense have forged especially close working relationships both in the context of the Emergency Mobilization Preparedness Board and with respect to the civil defense program.

CURRENT ISSUES

Mr. Chairman, in concluding my statement I would like to address briefly two issues that sometimes arise as we present our 1984 civil defense program to the Congress.

First, one of the key distinctions between our 1984 proposal and last year's program proposal which, though it was endorsed by many Members of Congress nevertheless was not passed by the full Congress—is there any basis to believe that Congress will approve the 1984 proposal in light of last year's decision?

The answer to question 1 is that there are significant strategy and focus differences between this year's proposals and our previous civil defense submissions. We believe these changes will provide the basis for a much different result this spring in Congress.

Under our integrated emergency management system explained in our program and budget submissions, civil defense projects and plans will provide much more focus on local community emergency needs and State requirements. The program mandates dictated from Washington will be lessened. IEMS, sir, is a "grassroots-up" implementation strategy.

Local leaders, working with State officials and Federal representatives, will now have a substantial voice in assessing the types of threats that communities face and the cooperative jointly supported steps needed to be taken in given timeframes to protect against these threats.

Also, and of particular importance, we will be placing much greater emphasis on establishing and upgrading fundamental all-purpose hazard readiness and response than we have done in past years.

I would point out to you, Mr. Chairman, that we have been in contact with State and local leaders, Governors, attorneys general, directors of civil defense, and so on, all around the entire country. We have brought them to our National Emergency Training Center at Emmitsburg to go through this process with them, and you will be pleased to know that we got a very favorable reaction to this new implementation strategy—which is based on last year's congressional deliberations.

Additionally, I am confident that the Congress this year will find all leadership in the administration speaking consistently in support of the President's proposal. This is shown by the statements of Defense Department representatives appearing before you today and Secretary Weinberger's correspondence to the committee in support of our budget request. Mr. Chairman, I spoke with Secretary Weinberger on Thursday again and he reaffirmed the statement of support that he sent to you and to other Members of the committee.

CONCLUSION

I believe that FEMA's 1984 request for $253.5 million for civil defense must be approved. Our national interest requires that we provide improved protection for our citizens in all emergencies, including the ultimate emergency, nuclear war.

The integrated approach to civil defense, which is in full accord with Presidential directives and with congressional intent as expressed in the 1980 and 1981 amendments to the Civil Defense Act, is a more coherent and effective method for developing this protection.

Mr. Chairman, I would be pleased to respond to any questions. Thank you.

[The prepared statement of Louis O. Giuffrida follows:]

PREPARED STATEMENT BY LOUIS O. GIUFFRIDA, DIRECTOR, FEDERAL EMERGENCY MANAGEMENT AGENCY

Mr. Chairman, I appear before you today to provide an overview of the Administration's fiscal year 1984 request for programs authorized under the Federal Civil Defense Act. I propose to address the civil defense program as it is reflected in our budget request, and suggest that issues concerning the relationship of the program to the U.S. strategic defense posture should be addressed by a representative of the Department of Defense.

Under Executive Order 12148 of July 20, 1979, FEMA is responsible for the design and deployment of the program, while a program and policy "oversight" function is assigned to the Secretary of Defense to assure that civil defense planning will continue to be " . . ." fully compatible with the Nation's overall strategic policy, and in order to maintain an effective link between strategic nuclear planning and [the civil defense program.]"

In short, we in FEMA are responsible for the civil defense program, and concentrate on its content and its lifesaving potential. The Department of Defense, by contrast, is concerned with its significance for strategic defense, in the context of overall U.S. strategic policy.

In this connection, we have noted that in the Second Session of the 97th Congress, 55 Senators—including seven members of this Subcommittee—co-sponsored Senate Concurrent Resolution 133, relating to Peace Through Strength. The third principle and goal in the Resolution was to "create a strategic and civil defense which would protect the American people against nuclear war. . . ." The Administration's fiscal year 1984 request would begin the development of improved protection for the American people. Without an increase in the resources devoted to the program, such as that reflected in FEMA's budget request for fiscal year 1984, it will not be possible to make significant progress toward the goal enunciated in Senate Concurrent Resolution 133.

For fiscal year 1984 the Administration is requesting $253.5 million for programs authorized under the Federal Civil Defense Act. This represents a $106.1 million increase over the $147.4 million appropriated by the Congress for fiscal year 1983.

Mr. Chairman, it is essential that the Administration's $253.5 million request be fully approved by Congress. This is necessary so that FEMA can fulfill the mandates assigned it by Congress in recent changes to the Civil Defense Act and by the President's 1982 National Security Decision Directive (NSDD) on civil defense.

The Congress itself, to a great degree, established the framework for the improved program now sought by the Administration. In 1980 the Congress enacted a new Title V to the Act, greatly expanding its scope and authorities.

Title V states that an improved program should be implemented to save lives and to enhance deterrence—that is, assist in making a war less likely—and that the program should be adaptable to help deal with peacetime disasters and emergencies. These policies are essentially the same as those in the President's 1982 decision (and the policies adopted in 1978 by the previous Administration in Presidential Directive 41). The Congress further amended the Act in 1981 to make it more explicit that funds provided for civil defense would be used in preparing for peacetime as well as attack-caused disasters, with the statutory definition of civil defense being expanded to encompass both types of disaster.

Title V specified civil defense program elements. These reflect the fact that people may be protected against lethal hazards either by providing shelter at or near their homes, schools, or places of work or—if time permits—by helping them move away from threatened areas. Thus among the key elements Title V enumerated for protection of the population are planning for emergency evacuation as well as the provision of shelter.

Providing protection by either method requires a number of operational systems and capabilities. Title V enumerates such elements as warning systems, emergency operating centers and related systems (such as communications) for the direction of lifesaving operations by civil governments at all levels, training programs, and planning for the well-being of disaster victims.

Our fiscal year 1984 request includes these and related elements, for example, a start on deployment of a modern communications and warning system, comprehensive planning for population protection by evacuation or sheltering, and assistance to State and local governments in establishing emergency operating

centers. The highlights of our fiscal year 1984 request appear on the chart in Attachment A, which also outlines the activities provided by each program element.

Our fiscal year 1984 request represents the first year of a multi-year program which, if approved by Congress, will strengthen the Nation's overall capability to respond effectively to emergencies of all kinds, including the most massive emergency of all, a possible nuclear conflict. The request emphasizes a comprehensive, all-hazards approach which is in keeping with the 1980 and 1981 amendments enacted by the Congress.

In recent years, most State and local governments have significantly increased their resources to deal with the ever expanding range of emergencies that threaten their citizens. Also, they have actively urged a higher contribution from Washington. For a long period, this basically fell on deaf ears. However, in the last several years it has become clear to national leadership that the Federal Government has not dedicated sufficient resources to meet its partnership commitments in the Civil Defense Act to State and local jurisdictions in assisting them to develop effective emergency planning and response capabilities.

Also, these programs have undergone several reorganizations that have disrupted continuity and effectiveness. Since World War II, Federal responsibilities for emergency management have been realigned a half-dozen times, and each type of emergency has often been addressed in isolation from other threats to the public. This is reflected in the separate statutory authorizations for earthquake hazards, hazardous materials, fire, and civil defense. These circumstances have not fostered good relationships with State and local governments or the best use of emergency management resources.

The Federal Emergency Management Agency (FEMA) was established to foster the development of a truly integrated national system for emergency management and provide a solid infrastructure, at Federal, State, and local levels and in the private sector, to plan for, mitigate and respond to emergencies of all types.

This administration has taken significant steps toward these goals. We have aligned FEMA programs on a functionally efficient basis and have consolidated the Agency, in Washington, from five different locations to one. We have assumed our charter from Congress and the President as lead Agency among Federal agencies with regard to emergency management functions, including major disaster readiness and response, strategic and critical materials stockpiling, industrial mobilization, and continuity of government. The President set the course for these steps by establishing the Emergency Mobilization Preparedness Board (EMPB), and by the issuance of a National Security Decision Directive calling for the orderly deployment of enhanced civil defense.

In addition, we have instituted a new implementation strategy for an Integrated Emergency Management System (IEMS). This strategy has been presented and discussed at length with the Defense Department, other leaders in the Administration and with State, local, private sector, and volunteer agency representatives.

The Integrated Emergency Management System approach is reflected in our 1984 budget request. This strategy is consistent with the Civil Defense Act, particularly its most recent changes. It is based upon the premise that there are common functions required in all emergency situations to protect the health and safety of citizens. The common functions include: Planning, warning, communications, direction and control, shelter, movement of people, and provision of food and health and medical resources. Placing our priority on these commonalities and establishing capabilities to deal with these requirements will provide a basic infrastructure and a foundation on which to build special capabilities to deal with the unique requirements of each type of emergency. Taken into account, of course, will be the variation in the scope, duration, speed of onset, and potential damage which characterize the range of emergencies we face as a Nation.

Fiscal year 1983 is a transition year, during which we are developing detailed guidance to put our new and more effective approach into full operation in fiscal year 1984. We need the full $253.5 million requested for the civil defense program to begin orderly deployment of the integrated emergency management system that is mandated by our mission. The funding levels of the past decade provided an organization but only marginal capabilities to protect life and property in emergencies of all types.

The integrated approach is designed to:

Meet the President's civil defense objectives as set forth in the 1982 National Security Decision Directive and the congressional objectives set forth in the 1980 and 1981 amendments of the Federal Civil Defense Act.

Foster a full Federal, State, and local government partnership with provisions for flexibility at the several levels of government for achieving common national goals.

Emphasize implementation of emergency management measures which are known to be effective.

Achieve more complete integration of emergency management planning into mainstream State and local policymaking and operational systems.

Build on the foundation of existing emergency management plans, systems, and capabilities to broaden their applicability to the full spectrum of emergencies.

The process by which the integrated approach to emergency management will work at the community level is important. A community which has, to this point, done little toward developing emergency management activities will begin a process to develop its emergency plans, governed by national criteria which are specific enough to provide guidance but sufficiently general to allow flexibility in developing plans for the local protection options they believe are most critical.

The process begins with a comprehensive hazard assessment prepared by the community, possibly in conjunction with State and Federal regional personnel, depending on the circumstances. It then proceeds through an analysis of capability, (identifying shortfalls of resources), and moves to the development of a generic operations plan with annexes for the unique aspects of individual emergencies, the maintenance of capability, mitigation activities, emergency operations, and evaluation of such operations. The jurisdiction will then be asked to prepare a multiyear development plan, followed by annual plan increments as the process proceeds. By following this process, a community can establish an Integrated Emergency Management System, with readiness to deal with both the common elements of preparedness and those requirements which are unique to individual emergencies. In jurisdictions which have already developed their planning process more fully, a number of the steps in this process may only need review or update.

OPERATIONAL IMPLICATIONS OF THE INTEGRATED APPROACH

In implementing IEMS, FEMA will capitalize upon the substantial body of experience in emergency management as well as the vast amount of in-place resources in communities throughout our nation.

For example, studies and actual experiences have shown that evacuation plans drawn up for one type of emergency can be used effectively in others. As recently as December 1982, there was a threat of a toxic chemical release at a plant close to the Waterford, Louisiana, nuclear power plant. Some 17,000 people were evacuated from the area between 5:00 and 7:30 a.m., using plans that had been developed for the contingency of an accident at the nuclear powerplant, not the chemical plant. In another such example, when Brunswick, Georgia, was threatened by Hurricane David in 1979, it had an emergency relocation plan. The evacuation of some 12,000 people in high-stress circumstances provided a good test of the plan, and proved its validity.

The use of civil defense emergency facilities and systems in peacetime disasters is routine. The National Warning System (NAWAS) is used to warn localities of severe weather threats, and local civil defense siren systems are used to warn the people about approaching tornadoes. Key officials direct life-saving operations from local Emergency Operating Centers during many types of emergencies, and emergency advisories and instructions in all sorts of situations are transmitted to the public by local officials, using stations of the Emergency Broadcasting System. Radiological instruments and trained personnel provide support in road accidents or other emergencies involving radioactive materials. Without these basic capabilities, which are supported by civil defense funding, communities would find it much more difficult to deal with local emergencies.

The integrated approach is based upon the fact that these and other emergency systems and capabilities are inherently multihazard in nature. In addition, FEMA is acting to maximize the multiple-hazards payoff of all preparedness elements. For example:

The current shelter survey will be broadened to an all-hazard survey, to identify protection against tornadoes, hurricanes, and other threats as well as nuclear attack effects.

Relocation plans will be modified to take into account all types of hazards requiring evacuation such as a hurricane, toxic spill, flood, nuclear reactor accident, or a terrorist threat. Integrated plans will also provide for the care and sheltering of people in reception areas who have been forced to evacuate by any of a variety of hazards. (This could include, for example, care of people from an area severely damaged by an earthquake, until repair of damaged buildings and power lines made it safe for them to return.)

Radiological defense officers will expand their ability to plan for and respond to all radiological hazards, such as major transportation accidents or other incidents that have potential for release of radioactive materials; accidents at nuclear power plants; and detonation of a nuclear weapon by accident—as well as a nuclear attack on the United States.

The use of shelter stocks and equipment will be examined for possible added benefits in local emergencies.

The above examples illustrate the potential for more effective emergency management inherent in an integrated system.

CONCLUSION

I believe that FEMA's fiscal year 1984 request for $253.5 million should be approved. Our national interest requires that we provide improved protection for our citizens for all emergencies, including the ultimate emergency, nuclear conflict. The integrated approach to emergency management, which is in full accord with Presidential directives and with congressional intent as expressed in the 1980 and 1981 amendments to the Civil Defense Act, is a more coherent and effective method for developing this protection.

Mr. Chairman, I would be pleased to respond to any questions that you and other subcommittee members may have.

ATTACHMENT A

HIGHLIGHTS OF FISCAL YEAR 1984 CIVIL DEFENSE BUDGET REQUEST

Fiscal year 1984 civil defense program

Table 1 summarizes our Civil Defense program budget request for fiscal year 1984.

TABLE 1.—FISCAL YEAR 1984 CIVIL DEFENSE PROGRAM REQUEST

[Budget authority in millions of dollars]

Appropriation and program	Actual, fiscal year 1982	Program, fiscal year 1983	Request, fiscal year 1984
State and local assistance appropriation	79.37	90.90	141.44
State and local emergency management	45.71	50.80	56.14
Radiological defense	8.41	10.30	19.90
Population protection	10.95	17.70	36.50
State and local direction, control and warning	14.30	12.10	28.90
Emergency planning assistance appropriation	29.01	29.18	78.70
Telecommunications and warning	10.23	13.18	42.20
Training and education	10.38	10.42	16.50
Research	8.40	5.58	20.00
Salaries and expenses appropriation	23.79	27.76	33.38
Total civil defense program category [1]	132.17	147.85	253.52

[1] Detail may not add due to rounding.

Highlights of program activities

As can be seen in Table 1, FEMA's request is divided among three appropriations: (1) State and Local Assistance, (2) Emergency Planning Assistance, and (3) Salaries and Expenses. Each will be briefly summarized in turn.

State and local assistance (SLA) ($141.44 million)

This program is designed to develop generic plans and emergency capabilities to mitigate, prepare for, respond to, and recover from emergencies caused by natural, technological, and attack-related hazards, through an integrated approach. This approach places priority on developing the preparedness elements common to all emergencies, and at the same time recognizes those elements unique to specific types of emergencies. Response and recovery capabilities common to most emergencies are obtained through preparedness programs that address warning, direction and control, resource management, evacuation, protective sheltering, lodging and feeding, maintenance of law and order, health and medical services, and government preparedness. These capabilities are obtained through emergency planning, organizational systems, training and public education. This new approach will integrate Federal civil defense objectives and support with State and local emergency operational requirements, thereby enhancing overall emergency preparedness for all hazards that could result from attack, natural disasters, or other peacetime emergencies. The objective of the program is to save lives and protect property threatened by such hazards. The SLA program supports the following elements.

State and local emergency management.—This program provides matching fund support for State and local civil preparedness staffs and operating costs to support emergency prepardness activities (approximately 1,100 State-level and 4,000 local emergency management professionals in some 2,500 jurisdictions).

Radiological defense.—The mission of Radiological Defense is to provide to individual citizens and officials the skills and knowledge, situation information, and guidance needed to minimize the effects of radiological hazards of all types. This is accomplished by (1) the establishment of radiological systems in States through Radiological Defense Officers fully funded by FEMA; (2) the training of radiation defense monitors, officers, and local instructors; (3) the acquisition, storage, maintenance, and deployment of radiation defense instruments; and (4) the preparation of public information on how to minimize radiation hazards for both peacetime and attack contingencies.

Population protection.—This program provides for developing State and local government plans, systems, and capabilities required to improve the survivability of the population from the effects of natural disasters, technological hazards, and nuclear attack. It includes (1) the development of plans to protect the population from nuclear attack and other hazards, primarily through a balance of evacuation and in-place protection options, with plans prepared by professional State planners funded by FEMA, assisted by local government personnel; (2) the development of data to support the planning effort (such as the identification of facilities which could be used for sheltering purposes); (3) the preparation and support of such facilities through such activities as shelter marking and the local stocking of shelter provisions such as water, food, and sanitation and ventilation equipment; and (4) analysis of means and methods of industrial protection (such as the development of all-hazard emergency operations plans, protection of essential workers, and safeguarding of production capability).

State and local direction, control, and warning.—This program provides for setting policy, designing programs and disseminating guidance and financial and technical assistance on the development implementation and maintenance of emergency communications, alert and warning systems, and command and control systems and facilities for State and local governments. The program also provides for the protection of communication systems and of selected broadcast facilities participating in the Emergency Broadcast System (EBS). These functions provide the basic capacity for the Nation's State and local leaders to maintain control of government resources, to communicate decisions to the public, and to deploy assets to meet critical needs. They are also the foundation on which the continuity of government is built and on which authority is exercised in the aftermath of emergencies.

Emergency planning and assistance ($78.702 million)

The Emergency Planning and Assistance Program supports the sub-elements of (1) Telecommunications and Warning, (2) Training and Education, and (3) Research.

Telecommunications and warning.—This program provides for warning and communications capabilities in emergencies of all types. FY 1984 activities will include upgrading the current warning system through adding about 200 warn-

ing points to provide improved coverage. At the same time, the deployment of a survivable communications and radio warning network will commence.

Training and education.—This program provides for the development of training materials and emergency management training programs primarily for key officials of State and local governments as well as for the public. The training courses cover the entire range of Civil Defense programs and are to be given to such audiences as: State and local elected officials; emergency managers and planners; emergency services personnel; radiological defense officers; shelter managers; and private citizens who are involved in the Civil Defense program.

Research.—This program provides the technical and scientific base for the integrated emergency management system. In addition to research on technical issues, guidance materials are developed for deployment, which frequently involves field tests with State and local governments.

Salaries and expenses ($33.375 million)

The salaries and expenses appropriation provides for the staff required to develop, implement, and manage the civil defense program (745 work-years).

Summary of fiscal year 1984 request

This attachment provides an overview of FEMA's fiscal year 1984 request. More detail will be provided on the individual program elements at the authorization hearings scheduled for April 1983.

The fiscal year 1984 request reflects a significant change in our program management and implementation strategy. The integrated emergency management approach, with its increased flexibility and its stress on building capabilities to respond to all types of emergency, will strengthen the Federal-State-local partnership specified by the Congress in the Federal Civil Defense Act.

This partnership is reflected in the fact that of the total fiscal year 1984 request, approximately 58 percent of the dollars are provided to State and local governments in the form of grants, matching funds, and equipment and services. The balance of the request also supports State and local emergency management by providing such overall infrastructure elements as an integrated national telecommunications system serving FEMA and the States. It also supports training activity at the Emergency Management Institute at Emmitsburg, Maryland, and in the Regions and States.

Senator WARNER. Thank you very much, General.

We prefer to hear from General Stilwell before we go to the questions.

General, not unlike the Senate which rolled on past midnight last night, I am sure with El Salvador and some other problems you have a full platter. So, I appreciate your being timely.

STATEMENT OF GEN. RICHARD GILES STILWELL, USA, RETIRED, DEPUTY UNDER SECRETARY OF DEFENSE FOR POLICY

General STILWELL. Thank you, Mr. Chairman, I am delighted to be here, sir. I will, as did my colleague General Giuffrida, submit my prepared statement to the record and confine myself to a short summary thereof.

As you are aware, sir, the Department of Defense and the National Security Council share responsibility for oversight of FEMA's civil defense efforts. That responsibility derives in part from a mandate we received from this committee several years ago specifically to insure that FEMA not become so enmeshed in disaster relief activities that legitimate needs of national security are overlooked.

In compliance with that mandate, we have for the past 4 years provided for this committee a written assessment of FEMA's successive proposed programs, together with an analysis of the data upon which our assessment has been based.

At this particular time, I respectfully request that our report on the fiscal year 1984 program proposal be entered into the record of this hearing. This is the letter that Mr. Giuffrida referred to, signed by Mr. Weinberger, addressed to the chairman of the Armed Service Committee. Mr. Weinberger specifically notes in his covering letter, "I am pleased to state that the program provided for in the proposed fiscal year 1984 budget fully supports and is consistent with the civil defense policy guidelines prescribed by the President."

A year ago when testifying before this committee we noted that a Presidential decision had been made to increase the resources devoted to civil defense. We took part in that decision and had hoped that FEMA would be able to begin that revitalized effort in October of last year. Unfortunately, this proved not to be possible.

Many people misconstrued the intent of the proposed program. Some were led to believe that it was an attempt to make nuclear war safer to use as an instrument of national policy, others, that it was a resurrection of ill-advised and long discredited schemes. Still others maintained that the program was an unworkable and cruel hoax espoused by an administration oblivious to the horrors of nuclear war.

Nothing, of course, could be farther from the truth.

In reality what was proposed then—and what is being proposed now—is a program that will lessen the likelihood of nuclear war by giving the American people a far better chance of surviving a hypothetical nuclear attack than they presently enjoy. Certainly, a responsible government can attempt no less for the people it serves.

In conjunction with other improvements in our strategic posture, spelled out in the President's Strategic Modernization Program, a credible civil defense program should make clear that the United States intends to maintain a capability to deny the Soviets any meaningful gain from the threatened use of nuclear weapons. Thus, it should contribute importantly to the deterrence of nuclear war, which is our universal objective.

If we are able to demonstrate such capability and resolve, the Soviets should at length recognize the futility of their attempts to achieve and exploit strategic nuclear superiority. When they do, the prospects for negotiating realistic arms control measures should improve.

The program that is proposed is modest. One only has to look at what it entails to dispel any illusion that it would eliminate our vulnerability to nuclear war or provide a false sense of security. Even the most massive civil defense program would not do that.

POTENTIAL FOR SAVING LIVES

What this program will do is to provide a greater potential for saving lives than our present civil defense capabilities afford.

We do not believe that the "all hazards natural disaster" stress contained in the proposed program neglects the legitimate needs of U.S. national security. On the contrary, we believe that it enhances them by reaffirming that disaster preparedness is indivisible and that it is indeed both possible and desirable that a single program serve the needs of disaster relief and nuclear attack preparedness.

PRESIDENT'S CIVIL DEFENSE POLICY

So, this is what the President's civil defense policy requires. First, a program that recognizes that preparedness for natural calamities and preparedness for manmade calamities are in reality two sides of the same coin.

Second, a program designed to realize the advantages of previously proposed population protection measures while eliminating their deficiencies.

Third, a program that acknowledges that disaster remains disaster, whatever its cause, that suffering remains suffering, whatever its source.

That social responsibility indeed requires us as a government and as a Nation to do what we can to prevent both, however limited our capabilities may be, rather than succumb to despair at the thought of the form these disasters may take or the challenges they may pose.

The proposed civil defense program, Mr. Chairman, is designed to forge a cooperative partnership of Federal, State, and local governments to enable communities throughout our land to do a better job of coping, should disaster strike.

Mr. Chairman, we believe this program is essential to the welfare and security of this Nation. We strongly urge the support of this committee for this proposed budget submission.

Thank you, sir.

[The prepared statement of Richard G. Stilwell follows:]

PREPARED STATEMENT OF RICHARD G. STILWELL, GENERAL, U.S. ARMY (RETIRED), DEPUTY UNDER SECRETARY OF DEFENSE FOR POLICY, DEPARTMENT OF DEFENSE

FISCAL YEAR 1984 CIVIL DEFENSE PROGRAM

Mr. Chairman, Members of the committee. I appreciate this opportunity to testify on behalf of the Federal Emergency Management Agency's proposed civil defense program for fiscal year 1984, and to assure you that it has the Defense Department's full endorsement and support.

As you are aware, the Department of Defense and the National Security Council share responsibility for oversight of FEMA's civil defense efforts. That responsibility derives in part from a mandate we received from this committee several years ago: to insure that FEMA not become so enmeshed in disaster relief activities that the legitimate needs of national security are overlooked.

In compliance with this mandate, we have for the past four years provided for this committee's consideration, a written assessment of FEMA's proposed program, together with an analysis of the data upon which our assessment is based.

At this time, I respectfully request that our report on the fiscal year 1984 program proposal, submitted on the 11th of February, be entered into the record of this hearing.

As Secretary Weinberger stated in this report—and I quote his words—"I am pleased to state that the program provided for in the proposed fiscal year 1984 budget fully supports and is consistent with the civil defense policy guidelines prescribed by the President."

A year ago, when testifying before this committee in support of FEMA's fiscal year 1984 budget authorization request, we noted that a Presidential decision had been made to increase the resources devoted to civil defense, to expand the program on a nationwide basis, and to lay the groundwork for repairing crucial deficiencies in previously proposed approaches for protecting our Nation against nuclear attack. We in Defense took part in that decision, and had hoped that FEMA would be able to launch this revitalized effort in October of last year.

Unfortunately, this was not possible. Many people misconstrued the nature and intent of the proposed program. Some were led to believe that it was an attempt to make nuclear war safer to use as an instrument of national policy. Others were led to believe that it was a resurrection of ill-advised and long-discredited schemes. Still others maintained that the program was unworkable, that it was a "cruel hoax" espoused by an Administration oblivious to the horror of nuclear war and to the magnitude of its effects, and insensitive to the enormity of what would be required to mitigate all of the damage that our Nation would endure.

Nothing could be further from the truth.

In reality, what was proposed then—and what is being proposed now—is a program that will, we believe, lessen the likelihood of nuclear war by giving the American people a far better chance of surviving a nuclear attack than they presently enjoy. A responsible government can attempt no less for the people it serves.

I need not remind the Members of this committee that, while the role of the Department of Defense is to cope with war, should it be visited upon us, its purpose is to contribute to the preservation of peace. All of use are well aware that the most fundamental purpose of the Administration's arms control and strategic force modernization initiatives is the prevention of nuclear war.

We believe that our ability to deter war will be strengthened if we can convince the Soviet leadership that a nuclear attack on the United States or its allies would yield no meaningful advantage. We believe that it is possible to convince the Soviets of this by demonstrating that we have the wherewithal to protect what can be protected of the substance of our Nation, and to inflict unacceptable levels of retaliatory destruction after absorbing a Soviet nuclear attack.

All elements of our five point strategic modernization program—including civil defense—bear upon this. They are aimed at preventing the further use of offensive weapons against us and our allies after a Soviet attack, through a capacity for prompt neutralization of remaining Soviet offensive assets, and through an enduring capability to bargain with the Soviets so that they will understand that use of their residuals will only result in additional damage to assets they value highly. To attain this capacity, the President's program emphasizes hard-target kill, command, control, and communications, secure reserve forces, and flexibility in targeting—all as elements of a credible retaliatory capability.

But this program aims as well at limiting to the extent we can—through improvements in our active and passive defenses—the damage that we would suffer from a Soviet nuclear attack. The program, therefore, emphasizes as well improvements in air defense, in our ability to sustain governmental continuity—particularly at state and local levels—after an enemy attack, and in our ability to mitigate, as best we can, the effects of such an attack upon the fabric of our society through an improved nationwide civil defense program.

Civil defense, therefore, is one element in an overall strategic posture made up of a variety of measures. We believe that this combination of defensive as well as retiliatory offensive improvements offers the best hope of restoring and maintaining the kind of strategic balance that will dispel any Soviet illusion that a resort to nuclear war will produce any meaningful gain.

The proposed civil defense program, therefore, is an integral part of our deterrent posture. It is an improved way of saving lives under peacetime and wartime conditions. As a peacetime capability, its usefulness in disaster relief is obvious. As a wartime capability for reducing population density in potential target areas—and thereby, the anticipated number of prompt fatalities—it complements our military efforts to make war less likely.

Some people argue that improved civil defense actually increases the likelihood of nuclear war by providing a false sense of security. No one who knows anything about the effects of modern nuclear weaponry can seriously believe that. It is doubtful whether any passive defense effort will ever reduce either side's vulnerability to a degree that the certainty of catastrophic devastation from nuclear attack would disappear. One has only to look closely at what the proposed civil defense program entails to dispel any notion that it would totally eliminate vulnerability to the effects of nuclear war.

Even the most massive civil defense effort would not provide such security.

And, as is evident, the proposed program is a modest, rather than massive, effort. It is large enough to improve the prospects of survival. But it is not large enough to increase the attractiveness of nuclear war.

If anything, civil defense, in conjunction with other improvements in our strategic posture, should help sustain just the opposite view—that the United States intends to maintain a capability to deny the Soviets any meaningful gain from the threatened or actual use of nuclear weapons.

If we are able to demonstrate such capability and resolve, the Soviets should recognize the futility of their efforts to achieve strategic superiority. When they do, the prospects for negotiating realistic arms control measures should be improved.

This Administration received a mandate from the American people to improve our Nation's defenses, and to redress the effects of years of neglect. The Defense Department considers the proposed civil defense improvement program an important part of our response to that mandate.

It is a program designed to realize the advantages of previous research in population protection measures, while eliminating the deficiencies of earlier proposals.

It is a program that recognizes that preparedness for natural calamities such as hurricanes or floods, and preparedness for man-made calamities such as chemical spills or nuclear attack, are, in reality, two sides of one and the same indivisible coin.

It is a program that acknowledges that disaster remains disaster whatever its magnitude or cause, that human suffering remains suffering whatever its source, and that social responsibility indeed requires us—as a government and as a nation—to do what we can to prevent it however limited our capabilities may be, rather than succumb in a paralysis of despair at the thought of the forms disaster may take, or the challenges disaster may pose.

It is a program designed to forge a cooperative partnership of Federal, State and local governments to enable communities throughout our land to do a better job of coping should disaster strike.

This partnership is what we mean when we speak of an integrated emergency management system and an all-hazards approach to civil defense improvement. Its achievement on a nationwide basis is what we seek through the funding increase that is requested. When we speak of an enhanced civil defense program, this is what we mean. This is what we are asking you to authorize.

In closing, let me summarize all of this in the context of the oversight mandate you have given us.

We in the Defense Department do not believe that the all-hazards natural disaster stress contained in FEMA's civil defense program proposal neglects the legitimate needs of U.S. national security. Rather, we believe that it enhances them, explicitly reaffirming something heretofore unchallenged—that disaster preparedness is indivisible, and that indeed it is not only possible, it is desirable for the capabilities produced in one program to serve the needs of disaster relief and nuclear attack preparedness.

That is what the President's civil defense policy requires.

Mr. Chairman, we in Defense believe that, if funded at the level requested, the proposed FEMA program can improve our Nation's capabilities in both areas. For that reason, we urge you to support this submission.

THE SECRETARY OF DEFENSE

WASHINGTON, THE DISTRICT OF COLUMBIA

11 FEB 1983

Honorable Melvin Price
Chairman, Committee on Armed Services
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

In response to the Senate Committee on Armed Service's 1979 request that an annual report on the Federal Emergency Management Agency's civil defense budget be provided to your Committee, I am pleased to state that the program provided for in the proposed FY 1984 budget fully supports and is consistent with the civil defense policy guidelines prescribed by the President. As noted in the accompanying staff analysis, the proposed program represents a significant first step toward achieving an improved and expanded civil defense capability.

The total funds spent during FY 1982 for nuclear attack preparedness were $132.7 million. An estimated $147.4 million will be similarly expended in FY 1983.

A satisfactory working relationship continues to exist between FEMA and Defense Department officials on matters related to the integration of planning for nuclear attack preparedness with other strategic planning.

A similarly satisfactory consultative relationship exists between the Defense Department and FEMA and the NSC staff on matters of civil defense policy and program content.

A copy of this report and the accompanying data has also been sent to the Senate Committee on Armed Services.

Sincerely,

Attachment
a/s

THE SECRETARY OF DEFENSE

WASHINGTON, THE DISTRICT OF COLUMBIA

11 FEB 1983

Honorable John G. Tower
Chairman, Committee on Armed Services
United States Senate
Washington, DC 20510

Dear Mr. Chairman John

In response to your Committee's 1979 request for an annual report on the Federal Emergency Management Agency's civil defense budget, I am pleased to state that the program provided for in the proposed FY 1984 budget fully supports and is consistent with the civil defense policy guidelines prescribed by the President. As noted in the accompanying staff analysis, the proposed program represents a significant first step toward achieving an improved and expanded civil defense capability.

The total funds spent during FY 1982 for nuclear attack preparedness were $132.7 million. An estimated $147.4 million will be similarly expended in FY 1983.

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A copy of this report and the accompanying data has also been sent to the House Committee on Armed Services.

Sincerely,

Attachment
a/s

OSD STAFF ASSESSMENT

THE FY 1984 FEDERAL EMERGENCY MANAGEMENT AGENCY

CIVIL DEFENSE PROGRAM

PREFACE

Effective July 15, 1979, responsibility for supervision of U.S. civil defense (CD) preparedness was transferred from the Secretary of Defense to the Director of the Federal Emergency Management Agency (FEMA). This transfer of functions was effected by Executive Order 12148 (July 20, 1979). Section 2-204 of this order assigns a civil defense policy and program "oversight" function to the Secretary of Defense:

> In order that civil defense planning continues to be fully compatible with the Nation's overall strategic policy, and in order to maintain an effective link between strategic nuclear planning and nuclear attack preparedness planning, the development of civil defense policies and programs by the Director of the Federal Emergency Management Agency shall be subject to oversight by the Secretary of Defense and the National Security Council.

In May 1979, the Report of the Senate Committee on Armed Services expressed concern that "...the civil defense aspects of the newly integrated FEMA not become enmeshed in the disaster relief aspects of the agency's work to the point where legitimate national security needs are not met." The Committee recommended that the Director, FEMA, consult with and seek the advice of the Secretary of Defense on the program, budget, and policies of those parts of the proposed FEMA budget relating to civil defense. The Committee also said that it expected the Secretary of Defense to establish "...a continuing and close relationship with the Administrator to insure that civil defense programs are developed in full coordination with military needs and with overall national security policy." Accordingly, the Committee requested that:

> At the same time the President submits the budget to Congress for fiscal year 1981, and for each subsequent fiscal year, the Secretary of Defense shall submit to the House and Senate Armed Services Committees a written report on that portion of the proposed FEMA budget relating to civil defense matters. The Secretary shall indicate in such report the extent to which-

(1) the program provided for in the proposed budget is sufficient to implement the civil defense policy guidelines prescribed by the President;

(2) funds were expended for nuclear attack preparedness planning in the preceding fiscal year; and

(3) planning for nuclear attack preparedness has been or is being integrated with other strategic nuclear attack planning.

The Secretary of Defense shall also include in such report his assessment of the adequacy and effectiveness of consultation between the FEMA Administrator, the Secretary of Defense, and the National Security Council on matters relating to civil defense, and his evaluation of the civil defense program provided for in the proposed budget for the fiscal year concerned.

This Staff Assessment has been prepared in response to the Committee's request, and is based upon program information provided by the Federal Emergency Management Agency.

US CIVIL DEFENSE POLICY

It is the policy of the United States to enhance the deterrence of strategic nuclear war through a strong and balanced program of strategic forces, including effective capabilities for strategic defense. Civil Defense, along with an effective Continuity of Government program, emergency mobilization, and secure and reconstitutable telecommunications systems, is an essential ingredient of our nuclear deterrent forces. It is a matter of national priority that the US have a Civil Defense program which provides for the survival of the US population.

The Program

Accordingly, the President has directed that the US Civil Defense program provide an improved basis for dealing with crises and carrying out eventual national recovery. The US Civil Defense Program will:

-- Enhance deterrence and stability in conjunction with our strategic offensive and other strategic defensive forces.

-- Reduce the possibility that the US could be coerced in time of crisis.

-- Provide for survival of a substantial portion of the US population in the event of nuclear attack preceded by strategic warning and for continuity of government, should deterrence and escalation control fail.

-- Provide an improved ability to deal with natural disasters and other large-scale domestic emergencies.

This policy complements primary US reliance on strategic offensive nuclear forces as the preponderant factor in maintaining deterrence.

Implementation

To implement the foregoing policies, the President has directed that the program consist of three major elements and adhere to the following timetable:

-- Population Protection. By the end of 1989, the development of plans and deployment of supporting operational systems will be completed. Primary reliance will be placed upon relocating the population of US metropolitan and other potential high-risk areas to surrounding areas of lower risk during a period of international crisis, taking advantage of extensive US transportation resources.

-- Industrial Protection. Analyses and preparations will be completed which will allow a funding decision to be made on a program to protect key defense and population relocation support industries.

-- Blast Sheltering. Analyses and preparations will be completed which will allow a funding decision on blast shelters for key industrial workers in defense and population relocation support industries.

Management

The Federal Emergency Management Agency will have overall operational supervision of this program. Funds for the program will be contained in the FEMA budget. In order to ensure interagency cooperation and support in the program, the Civil Defense Working Group of the Emergency Mobilization Preparedness Board will be responsible for, among other things, assuring coordination between the Civil Defense program and mobilization preparedness actions and programs, and the preparation of semi-annual reports to the President.

FY 1984 PROGRAM OBJECTIVES

In order to accomplish these tasks as rapidly and cost effectively as possible, improvements will be made during FY 1984 in a number of mutually supporting areas of program activity.[1]

POPULATION PROTECTION:

- o Planning:
  - -- Develop additional evacuation plans.
  - -- Indirectly assist localities in developing comprehensive plans for response to peacetime hazards, based on localized all-hazard vulnerability analyses.
  - -- Develop emergency instructions for the public.
- o Facility Survey, Engineering, and Development:
  - -- Continue host and risk area surveys.
  - -- Identify facilities required for protection against natural and technological hazards, and suitable for expanded congregate-care and in-place sheltering.
  - -- Develop techniques for crisis shelter upgrade planning.
- o Shelter Preparation:
  - -- Mark about 25,000 existing facilities.
  - -- Explore development of multipurpose shelter marking signs.
  - -- Develop shelter life-support systems (ventilation, food, water, and sanitation).
  - -- Study peacetime use of emergency shelter stocks and equipment.
- o Shelter Management:
  - -- Train some 1500 Shelter Systems Officers, and 55,000 Shelter Managers.

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[1]FEMA's civil defense accounting system was restructured in December, 1982. Program area identifications contained in this report reflect the new account names, which differ somewhat from designations used in previous Oversight Reports.

INDUSTRIAL PROTECTION:

- Complete a detailed identification of key-worker shelter requirements, and construction of prototype shelters begun in FY 1983, together with related work to refine cost data.
- Accelerate industrial protection planning.
- Accelerate research on countermeasures and strategies to enhance post-disaster recovery potential.

RADIOLOGICAL DEFENSE:

- Fund all full-time Radiological Defense Officers, and approximately 100 Assistant Radiological Defense Officers for State operations staffs.
- Develop an "All-Hazards" instrumentation program.
- Reconfigure and improve existing radiological instruments.

STATE AND LOCAL DIRECTION, CONTROL AND WARNING:

- Provide funding and national support for maintaining and improving State and local direction and control capabilities.
- Using guidance developed in FY 1983, consolidate assistance for operating facilities and equipment, electromagnetic pulse (EMP) protection technical support for Emergency Operating Centers, Emergency Broadcast System Stations, and related emergency reporting and damage assessment systems.

DIRECTION AND CONTROL EXERCISES:

- Test system equipment and procedures for efficiency and reliability.
- Train emergency staffs.

NATIONAL COMMUNICATIONS AND WARNING:

- Maintain and upgrade current systems through addition of an estimated 200 warning points.
- Begin deployment of a more survivable communications and warning network.

EMERGENCY PUBLIC INFORMATION:

- Print and distribute new school materials.
- Train an estimated 1000 teachers in their use.

RESEARCH AND DEVELOPMENT:

- Develop and refine more cost-effective approaches to all-hazard emergency preparedness.

MANAGEMENT AND SUPPORT:

- Integrate federal civil defense objectives and support with state and local emergency operational requirements.
- Enhance overall emergency preparedness for all hazards that could result from natural disaster, attack, or peacetime emergencies.

PROGRAM PRIORITIES

Table 1 displays major areas of FY 1984 activity in order of budget emphasis.

Table 1

Budget Prioritization

MANAGEMENT AND SUPPORT (Overhead)	$97.5 million
NATIONAL COMMUNICATIONS AND WARNING	36.5
STATE AND LOCAL DIRECTION, CONTROL AND WARNING	34.6
POPULATION PROTECTION	29.7
RESEARCH AND DEVELOPMENT	20.0
RADIOLOGICAL DEFENSE	19.9
MISCELLANEOUS	14.1
Industrial Protection ($8.2 million)	
Direction and Control Exercises ($4.8 million)	
Emergency Public Information ($1.1 million)	
Total	$252.3 million

Management and Support accounts for the largest single portion of the FY 1984 budget.

National communications and warning will constitute the largest single area of non-overhead related expenditures. These funds will be used to improve the quality, reliability and robustness of federal civil emergency communications and warning networks.

State and Local Direction, Control and Warning is next in order, and will emphasize the development of State and Local Emergency Operating Centers and associated communications. Of the $34.6 million allocated, $6.25 million is earmarked for electromagnetic pulse protection of Emergency Operating Centers and $3.95 million for Emergency Broadcast System and Broadcast Station Protection.

Both of these efforts are consistent with civil defense policy guidance that the civil defense program "fully support governmental continuity, survival and endurance in time of war." Both, therefore, contribute to nuclear attack preparedness.

Population Protection efforts will focus for the most part on improvements in local crisis relocation planning and shelter identification and preparation measures in order to make them more amenable to "all-hazard" applications, rather than those exclusively tailored to natural disasters or nuclear attack.

Research and Development activities and Radiological Defense receive roughly equal priority, with the latter promising the largest single area of immediate tangible improvement in the entire program through a substantial increase in the number of available trained technicians. The largest expenditure within the radiological

defense area, however, is some $13.3 million allocated for instrumentation engineering, procurement, maintenance, calibration and logistical support.

Collectively, these six non-overhead areas account for nearly $141 million. Nearly $98 million in overhead has been programmed to cover federal, state and local management and support expenses. The remaining funds (roughly $14 million) have been apportioned to support Direction and Control Exercises, the development of emergency procedures training for the public, and the development of the industrial/keyworker protection data explicitly called for in the civil defense national security decision directive. The latter effort, funded at $8.2 million, recognizes the key role of industrial protection in making population relocation sustainable, and therefore in providing the enduring posture under wartime conditions that policy requires.[2]

Of the total $252.3 million proposed, some $147 million has been allocated against state and local accounts, with roughly $107 million remaining in the federal account structure.

Allocation balances were derived from the principal managerial thrust of the FY 1984 program: improved responsiveness to state and local needs through an "all-hazard" approach to improving civil defense capability. This orientation is based on the explicit policy requirement that the civil defense program "provide an improved ability to deal with natural disasters and other large scale domestic emergencies." It acknowledges the dual nature of the program, and, when accompanied with appropriate managerial safeguards to be developed during FY 1983, will insure that neither nuclear attack nor natural disaster preparedness needs will be neglected.

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[2]Some $3.8 million in additional funding is included for this purpose in the $20 million allocated to Research and Development.

EXPECTED PROGRESS

The Administration had hoped to begin implementing an improved nationwide civil defense program in FY 1983. That appropriation, however, provides only steady-state funding. The FY 1984 request represents substantial real growth that, if supported by the Congress, can constitute a significant first step toward developing the improved civil defense capability mandated in the Federal Civil Defense Act of 1950 and current Administration policy.

Table 2 describes the cumulative progress that has been made in principal program areas, and the progress that is forecast for FYs 1983 and 1984. Progress is expressed as a cumulative percentage of the capability needed in each major category of effort in order to maximize its contribution toward achievement of required protective capacity. One hundred percent achievement in every listed program element, therefore, would equate to full achievement of the civil defense posture called for in current policy.

To the extent that the percentage differences between FY 1983 and FY 1984 show increased capability, they indicate that the FY 1984 program has been designed to move forward more rapidly, and therefore is consistent with the requirements of the President's policy.

Table 2

Nationwide Program Status (as of January 4, 1983)

Program Area	Percent Complete as of End: FY 1982	FY 1983[1]	FY 1984[2]
POPULATION PROTECTION			
Nuclear Civil Protection Planning[3,4]			
Initial Crisis Relocation Plans	37%	50%	63%
Above plus In-Place Shelter Plans	38%	48%	56%
Above plus Enhanced CRPs	---	0.2%	1%
"All Hazard" Plans	---	---	---
Emergency Instructions to the Public	0.3%	0.3%	16%
Facility Survey, Engineering & Development[5]			
Host Area Surveys	68%	81%	99%
Risk Area Surveys	23%	24%	35%
Crisis Upgrading	---	---	---[6]
Multi-Hazard Survey	---	---	---[7]
Shelter Preparation			
Shelter Marking	25%	23%	30%[8]
Shelter Stocking	---	---	---[9]
Shelter Ventilation Kits	---	---	---[9]
Shelter Management[10]			
Shelter System Officers	7%	13%	18%
Shelter Managers	0.1%	0.4%	5%
RADIOLOGICAL DEFENSE			
Planning & Development			
State & Asst. State Radiological Defense Officers (RDOs)(Fully Funded)[11]	15%	21%	61%
State, Asst. State, and local RDOs (Volunteer or matching fund support)	46%	57%	57%
Radiological Monitors (RMs) for Emerg. Services/aerial monitoring	27%	26%	27%
RM Instructors (for Crisis Training)	41%	39%	44%
Instrumentation			
Shelter/Postattack	2%	2%	2%
Other	43%	43%	43%
STATE & LOCAL DIRECTION, CONTROL & WARNING			
Emerg. Operating Ctrs (State/State Area)[12]			
Direction & Control Features	57%	58%	64%
Facility Operational Features	54%	55%	61%
Survivability Features	62%	63%	69%
Electromagnetic Pulse Protection	15%	16%	17%

Table 2 (Continued)

Program Area	Percent Complete as of End: FY 1982	FY 1983[1]	FY 1984[2]
Emerg. Operating Ctrs (Host Areas/Local)[12]			
Direction and Control Features	39%	40%	42%
Facility Operational Features	32%	33%	35%
Survivability Features	33%	34%	36%
Electromagnetic Pulse Protection	1%	1%	1%
Emerg. Broadcast System Guidance & Assistance[13]			
Station Protection	23%	24%	25%
Electromagnetic Pulse Protection	8%	9%	11%
DIRECTION AND CONTROL EXERCISING[14]	13%	18%	31%
NATIONAL COMMUNICATIONS AND WARNING[15] (Federal Warning Points)	43%	44%	47%
EMERGENCY PUBLIC INFORMATION[16] (Crisis Citizen Training)	0.3%	0.3%	16%

[1]End-FY 1983 estimates are based on an FY 1983 appropriation of $147.4M, rather than the $252.3M requested (FY 1983 dollars).

[2]FY 1984 status estimates are based on an FY 1984 budget request of $252.3M (FY 1984 dollars).

[3]FY 1983 is a transition year to the Integrated Emergency Management System (IEMS) approach, with implementation beginning in FY 1984. At that time, Population Protection Plans will address all hazards, and Nuclear Civil Protection plans (including both crisis relocation plans and in-place protection plans) will be incorporated into the new Population Protection Plans.

[4]Percentages shown reflect a change in the total number of crisis relocation plans required from 3,043 to 3,135 local jurisdictions. Data on in-place shelter plans reflect a thorough review and update carried out at end-FY1982. Some plans formerly counted as complete were determined to be outdated.

[5]Program element designation changed from National Shelter Survey. Element also includes Crisis Upgrading. Beginning in FY 1984, multi-hazard surveys will be conducted, including survey of shelter required for nuclear attack.

[6]During FY 1983, a "catalogue" is being developed with will depict in detail how to upgrade typical host area structures to increase fallout protection. The "catalogue" should be completed during FY 1984, and will be designed to eliminate or substantially reduce the need to revisit or resurvey all the facilities to be upgraded.

[7]Multi-hazard facility surveys and workloads will be based upon hazard vulnerability assessments to be conducted during FY 1983, and on the designation of exemplary project areas. It is anticipated that about 10 such areas will be designated for FY 1984.

[8]Because of FY 1983 appropriation reductions, no funds are available for shelter marking. However, funds are requested to mark facilities in FY 1984. Data on the status of shelter marking reflect an estimated 10 percent per year reduction through FY 1983 attributable to sign deterioration and removal.

[9]Because of FY 1983 appropriation reductions, no funds are available to prepare for FY 1984 production and deployment of shelter stocks and ventilation kits. Funds requested in FY 1984 for these purposes will be applied to the design and testing of candidate supplies, equipment and systems, as well as plans for their deployment. Wherever possible, production packages will be prepared for use in FY 1985 so that production and deployment can commence in FY 1985.

[10]FY 1981 and 1982 Shelter Management activities concentrated on development and test of a new course for Shelter System Officers (SSO), as well as an updated course for Shelter Managers (SM). Other activities included conduct of a Shelter Manager Instructor (SMI) course, using materials developed previously, as well as SM courses. SSO progress shown for FY 1982 reflects training of an estimated 1,300 students in the old SMI course and during initial deployment of the new SSO course. Also, an estimated 700 SMs were trained during FY 1982. In FY 1983, an estimated 1,400 SSOs will be trained, using the new course, plus 4,000 SMs. In FY 1984, an estimated 1,500 SSOs will be trained, plus some 55,000 SMs. Data may be adjusted in the future, as Shelter Management activities gather momentum, to reflect personnel trained and assigned as part of local government emergency organizations.

[11]Radiological Defense Officers (RDOs) are responsible for developing and managing an integrated emergency system for technological hazards, including nuclear attack. Total requirement is for 52 State and approximately 200 Assistant State RDOs. Status data for some categories of trained personnel (RMs, RM Instructors) show a decrease in FYs 1981-1983; this results from the fact that while available funding permitted some training, this was not sufficient to offset attrition.

[12]Elements of Direction and Control (D&C) capabilities are defined as follows:

(a) "Direction and Control Features" include an emergency operations plan, day-to-day use by emergency services, EOC displays, and related features.

(b) "Facility Operational Features" include an emergency power generator with 14-day fuel supply; and communications between the EOC and local operational forces, broadcast media, and higher, adjacent and (when applicable) lower levels of government.

(c) "Survivability Features" include a fallout protection factor of 100, ventilation, water supply, and sanitation facilities.

(d) "Electromagnetic Pulse Protection" is self-explanatory.

Beginning in FY 1982, FEMA required that project applications provide for upgrading capabilities to meet minimum standards in the areas of Direction and Control Features, Facility Operational Features, and Survivability Features.

[13]Data on "Station Protection" refer to provision of fallout protection, emergency power, and communications to an appropriate Emergency Operating Center. The total requirement for protected stations is currently estimated at 2,771 broadcast stations, but may be adjusted based on analysis and study.

[14]Status percentages for Direction and Control exercising reflect exercises conducted in FYs 1981 and 1982, and those projected for FYs 1983 and 1984, given an annual requirement for 3,040 exercises. The quality (depth and detail) of exercising will be enhanced in FY 1984, as substantial additional effort is applied.

[15]Warning point requirements are currently estimated as 5,800 nationwide versus some 2,400 land-line warning points installed as of end-FY 1981, as part of the National Warning System (NAWAS). As a low-frequency radio warning system is installed as part of an accelerated program, land-line-service warning points will be replaced by LF radio warning receivers. The currently estimated requirement of 5,800 warning points may be adjusted in the future, as the radio warning system is deployed.

[16]Data for Crisis Citizen Training Capability for FYs 1981 through 1983 reflect continuation of a prior school training program in approximately 15 to 20 percent of school districts nationwide, which provides capability for "live' instruction of parents and other adults in civil defense survival subjects during a period of developing international crisis. FY 1981 to FY 1982 activities included the development and field test of new materials for school training, with potential for use in adult education during a developing crisis, as well as the development of a self-study course for adults. FY 1983 activity is focused on evaluation of the new school materials (for grades K-12) and on development of a comprehensive public education program. FY 1984 activities will include training of an estimated 1,000 teachers in use of the new school training materials, as well as printing and distribution of the materials.

FUNDING

Table 3 displays in constant FY 1984 dollars civil defense funding levels for FY 1982 and FY 1983 for each essential category of activity. It also displays the FY 1984 budget request. Comparison reveals the areas in which program expansion is planned to take place. Data are current as of December 22, 1982.

Table 3

Civil Defense Budgets for FY 1982 - FY 1984
(Millions of FY 1984 Constant Dollars)

	FY 1982	FY 1983	FY 1984
POPULATION PROTECTION			
Planning			
Crisis Relocation Planning	$ 9.12	$ 9.14	$12.30
Instructions for the Public	---	---	.70
Facility Survey, Engineering & Development[1]	4.21	4.52	12.90
Shelter Preparation			
Marking	---	---	1.10
Stocking	---	---	.60
Ventilation Kits	---	---	.70
Shelter Management (Training)	.53	.53	1.40
INDUSTRIAL PROTECTION			
Key Worker Shelter	---	3.78	7.10
Industrial Protection	---	1.16	1.10
RADIOLOGICAL DEFENSE	11.40	10.83	---
Planning and Development	---	---	6.56
Instrumentation	---	---	13.33
Other (Fallout Forecasting)	---	---	0.01
STATE & LOCAL DIRECTION, CONTROL & WARNING			
Emergency Operating Centers	7.49	6.41	16.90
State/Local Warning & Communications Systems[2]	3.98	3.47	7.50
Emergency Broadcast System (EBS) Guidance & Assistance[3]	2.96	2.10	3.95
Other State/Local Direction, Control & Warning[4]	2.63	3.15	6.25
DIRECTION AND CONTROL EXERCISES	1.35	1.05	4.80
NATIONAL COMMUNICATIONS AND WARNING	11.80	11.45	36.50
EMERGENCY PUBLIC INFORMATION			
Crisis Citizen Training	.90	.42	1.10
RESEARCH AND DEVELOPMENT	9.98	6.73[6]	20.00[6]
MANAGEMENT AND SUPPORT			
Federal Management	27.25[5]	28.69	32.20
State and Local Management	50.33	51.50	54.00
Mobilization Designees	---	1.58	1.80
Training and Education	8.86	8.09	7.70
Public Affairs	*	---	1.50
Supporting Activities	.30	.32	.30
TOTAL BUDGETS	$153.09	$154.92	$252.30

(All data as of Dec 22, 1982)

Table 3, Notes

(*) Included in Training and Education figure.

[1]Includes Crisis Upgrade Planning.

[2]Includes the former Supporting Materials and Communications and Warning Planning programs.

[3]Includes the former Broadcast Station Protection Program and Emergency Broadcast System (EBS) Operational Area Planning Guidance Programs.

[4]Includes the former Maintenance and Services and Electromagnetic Pulse (EMP) Technical Support programs.

[5]Includes FY 1982 budget adjustments adding $4.17 million for increased AT&T tariffs, $2.29 million for salary shortfall, and $1.25 million for pay raise (all in FY 1984 constant dollars).

[6]Includes $0.32 million (FY 1983) and $3.8 million (FY 1984) for Industrial Protection Research.

PLANNING AND CONSULTATION

The creation in spring, 1981, of a Directorate for Emergency Planning within the Office of the Under Secretary of Defense for Policy established a central focal point for coordination of all Defense Department and FEMA efforts in a variety of emergency preparedness areas. Among them were civil-military mobilization planning and civil defense.

Since that time, there has been a marked increase in day to day substantive consultations between FEMA and Defense Department officials on matters involving nuclear attack preparedness. To facilitate this, the number of military officers assigned to FEMA has increased, as has the number of ad hoc joint planning meetings devoted to improving mutual support under crisis and wartime conditions.

FEMA's national civil sector readiness plans continue to be exercised in conjunction with major Defense Department command post exercises such as IVY LEAGUE and PROUD SABER. The design of these exercises has been improved through more extensive scenario integration in order to allow senior civil and military policy and decision makers to address the compatibility of proposed civil defense and military mobilization measures under varying conditions, and to explore the need for modifications and improvements.

The effect of this has been a steady discernible improvement in the quality of joint FEMA-DoD attack preparedness planning. In turn, this has engendered improvements in the extent of consultation between FEMA, DoD and the National Security Council staff over matters of civil defense policy and program content.

SURVIVABILITY FOLLOWING NUCLEAR EXCHANGES

Senator WARNER. Thank you, General.

I am going to lead off with a question to General Stilwell.

We had a hearing before this Subcommittee on Strategic and Theater Nuclear Forces several days ago on the RISOP/SIOP which, General, you know well—both generals do. Essentially, it lowers the capability of the Soviet Union, the capability of the United States, and the survivability of their respective weapon systems following certain scenarios.

Of course, it is a highly classified thing and I naturally cannot discuss it in open session. The thrust of the most perplexing question asked by a number of my colleagues, particularly some of the new Members of this committee went along the following lines:

First, another fact. Again, that scenario shows that after certain exchanges the Soviet Union possesses considerably more in preserved launchers and warheads than does the United States. In justification for the President's modernization program for our strategic forces that point is made, the disparity.

A number of my colleagues kept propounding the question:

Well, given this disparity of a greater reserve and survivability of certain Soviet systems, or what value is it in terms of the remnants left in the United States to our structure of cities, the infrastructure of people and the like?

Good morning, Senator Nunn. We have just covered the opening statements of both of these distinguished gentlemen. I have explained to them the Senate went on well past midnight last night and that accounts a little bit for our tardiness.

I was posing, Senator Nunn, the interesting question that was posed the other day by our colleagues and that is after the briefing on RISOP/SIOP showing a disparity in the survivability of Soviet weapon systems, launchers, a variety of things like that. The question was asked, "Well, of what value are these excess and reserve Soviet forces in view of the obvious destruction of the United States?"

We pressed, well, what is the quantum of destruction to the United States, and essentially they said, "Well, those studies are not within the domain basically of the Department of Defense," and then more or less indicated that FEMA did those studies.

So, can you give us, to the extent we can in open—and if necessary we will go into a closed session because this subcommittee does need that data—in open session, what can you advise us about the magnitude of what is left here in the United States for the Soviets to target their successive strikes against?

It is difficult to pose the question. I suppose it is difficult to answer it in open session but nevertheless, this is being debated widely in these freeze deliberations, both in the Congress and outside of Congress. Those of us like myself and Senator Nunn who are actively taking part in these debates have to respond. Therefore, we have to get a hold of some material that is usable in the open forum.

What help can you give us on that, General Stilwell?

Again, the theory being, why build more warheads just to have a greater reserve following an exchange when it is of questionable value in terms of trying to save something in the United States.

General STILWELL. If I may approach this from two directions, Mr. Chairman.

Senator WARNER. Have I adequately phrased this reflection?

General STILWELL. I think so. We are asking among other things the thought processes of the Politburo in the design of their strategic forces, both their size and their configuration.

Senator WARNER. And on that point I believe we are now getting into the open and I hope the President will make it clear that they are definitely moving in the direction of a first-strike capability.

SOVIET VIEWS

General STILWELL. Yes, sir. As a matter of fact, it is basic to their doctrine, in my view.

They look upon their strategic nuclear forces from two vantage points, as we attempted to set forth in the recent publication called, "Soviet Military Power," which I had some hand in producing. The first and most important function of their strategic nuclear forces, as indeed all of their military power, is to support their objective of attaining preeminence in world affairs by means short of war. I think we can all agree on that.

They believe that, although strategic nuclear power, is only one component of the total array of military power it is the fulcrum on which all others depend, and that a measurable edge in strategic nuclear power would give them the opportunity for mischief on a global scale, particularly in being able to coerce, to instill despair, paralysis, whatever, and gain their ends without bloodying any more Russian bayonets.

But they are also prepared to fight at any level at any time. In my view they have specifically designed their forces to be massively and decisively employed to destroy their adversary's capability and will to continue the conflict. They do believe, in my view, that a nuclear war can be fought, that they can survive it, and that they can win it. They recognize rather pragmatically that war at any level is a two-sided game and its intensity, its scope, and duration can therefore not be predetermined.

Therefore, as they do in the design of all their forces they provide for redundancy, for reserves, and most of all they look upon the greater size and capability of their forces as important means of insuring that they have the strongest negotiating position in bringing about war termination on their terms.

That I believe to be their concept: Why they have a lot of forces specifically designed against the target system which they consider must be handled by their forces. Why they have reserves, why they have surfeit, as we see it, above and beyond what is needed for deterrence.

So, that is my view, sir, of their forces. That they believe that they can prevail without war, but against the eventuality that there might be war they have prepared themselves to insure that they come out on the upper side.

Now, from our standpoint, as this committee has heard from experts far more qualified than I am, our job is not to match them. Our job is to insure that we have the kind of force structure that can absorb a first blow.

Senator WARNER. First deter firing of a single shot.
General STILWELL. Yes, sir.
Senator WARNER. Then absorption is second.

DETERRENCE

General STILWELL. But the heart of deterrence, Mr. Chairman, is to induce in the Soviets' mind the conviction that we have the capability to absorb a hypothetical first strike and still have residuals with the power and the accuracy to put at risk some portion of their political and military command structure, and of their forces of a level which the Soviets would consider unacceptable, and therefore would provide no incentive for a first strike.

I believe that to be the heart of deterrence.

Senator WARNER. I think you have stated it very succinctly. I think the emphasis on your question is to put at risk their leadership, civilian and military, and certain forces.

Right now the imbalance between the two nations is that we have a greater ability to do the old "MAD" type of retaliation as opposed to surgical strikes, counterforce strikes against priority military targets and, to a certain extent, forces.

General STILWELL. That is correct, sir. That is absolutely correct. That is the heart of the problem.

Senator WARNER. That is the heart of the modernization, an imbalance issue.

Now, our colleagues were pressing,

Well, given all that, there is such mass destruction here in the United States as a consequence of that first strike, why go pressing on to get additional weapons to take possibly a few of the remaining leaders of the Soviets, civilian or military targets? After all, the U.S. cities are level.

General STILWELL. Yes, sir, but again the heart of the question is the ability to survive the kinds of systems that really put at risk the crown jewels of the Soviet empire. That has to start with their overall military, political, and military command structure. That is what the Soviet empire starts with and the loss of that means everything to them. It means everything.

To do that you need the kinds of systems that are at the forefront of the President's strategic modernization program, survivable systems, accurate enough, powerful enough to do that job.

General GIUFFRIDA. Mr. Chairman?

Senator WARNER. Yes. Again I want to press on, what is left after some of these first-strike scenarios in our United States? We have to get that into the record.

U.S. SURVIVAL

General Giuffrida, you wish to comment?

General GIUFFRIDA. I will not address the military portion of what survives, Mr. Chairman. But I would just add that the definition of deterrence of necessity has to include not simply a well-staffed, equipped military force but also a system for continuity of government, and protection for the population, vital industrial assets, strategic materials, et cetera.

Though they are several years old, there have been a series of studies done on your question, "What would be left and why would it be worth

it?" They were done, in fact, by DCPA, the Defense Civil Preparedness Agency, and by the Secretary of Defense's Office of Program Analysis and Evaluation.

Senator WARNER. How old are those studies?

General GIUFFRIDA About 3 or 4 years I think, sir. I do not know the precise date.

Senator WARNER. Now, in terms of the Soviet modernization that has taken place since then, how outdated would those studies be?

General GIUFFRIDA. Well, in terms of what would be left to worry about in the United States as a national entity, even the most pessimistic of those studies forecast that about 40 percent of the people in the United States, after all of the devastation, would survive. Forty percent is a significant survival factor under the kinds of lay-downs that have been built into some of these worst-case scenarios.

My own personal guess, Mr. Chairman, is that if we went back and did the studies and factored in some of the things we have been able to do—even without sufficient amounts of money—that that percentage survival factor would go up.

If your schedule had been flexible enough to watch NBC's program the other night on the destruction of Charleston with a nuclear device, it was almost a scenario for the civil defense program in a sense.

There was a terrorist scenario. A bunch of scientists who had been working on nuclear weapons decided enough was enough. They stole some radioactive material from the State of Washington; built a device; put it on a barge; went down to Charleston and said, "Bring us all of the explosion modules for the Trident subs and the rest of the weapons in this area or we are going to blow up the city of Charleston."

The President finally, when it became a credible threat, the President ordered the evacuation of the city of Charleston. NBC came on and said, it is a terrible plan, they have not figured out how to handle a traffic jam. The device ultimately went off. The city was demolished. The same NBC commentator comes back on and says, "There were only 2,000 casualties. Lord knows what they would have been if people had not evacuated."

What I am leading to is that we have improved since those studies that were done some 5 or 6 years ago the ability of the State and local communities whose responsibility it is to develop those plans.

So, my guess would be that we are looking at a 40- to 50-percent survival factor, minimum.

Senator WARNER. Senator Nunn, if you have some questions, go ahead.

Senator NUNN. I do not want to interrupt you.

Senator WARNER. No, but you sat through, I think, some of that exchange. The question was left, why go ahead and press on with the President's strategic modernization program so intensively when it really will just enable us to conduct a second exchange with only 40 percent of the American people surviving.

NEED FOR PROTECTION

General GIUFFRIDA. Mr. Chairman, I certainly hope that we have not lost the national determination to survive. I would hope that we

are all determined, first of all to avoid war but second, not simply to lie down without any kind of protection plan either for our strategic systems, our military forces, or the rest of the Nation.

Senator WARNER. Well, I did not mean to infer that any of our colleagues who were propounding these questions had lost the will to survive.

General GIUFFRIDA. My comment, sir, is addressed not to the members of the committee. But I listen to that kind of question, "Why do anything?"

When I leave here I am going to meet with the American College of Surgeons in plenary session, their trauma medicine meeting in San Antonio. I know I am going to be hit with the same, "Well, why do anything?" I have heard people in that group say to me, "I am going to get a bottle of gin and go down to the center of Boston and get stoned, and wait for the bomb."

Senator WARNER. Just ballpark figures, our strategic request this year, the administration's is $28 billion, somewhere in that area. Your modest budget is a little in excess of $200 million.

Why not begin to have a greater emphasis on our civilian defense? This question is asked each year and while I think I know the answers, I am going to propound the question again.

In comparison to what the Soviets are doing the disparity between our $28 billion and your budget is so great, why even put the extra $100 million in? That is exactly what happened last year in conference. Of course, the conferences are not open to the public. I was there. While I advocated your budget, my voice was the only one heard. In a very few minutes the hundred million——

General GIUFFRIDA. About $106 million.

Senator WARNER. The $106 million, $104 to $106 million, to my recollection, was stripped and we went on to the greater issues involving the $28 billion or whatever last year's budget for strategic forces was.

General GIUFFRIDA. Your question, Mr. Chairman, to General Stilwell postulated a strike against our counterstrike capability.

The numbers of percentage of survival that I was giving you contemplated a general lay down and not a selective lay down against our counterforce capability.

If we were to have a lay down against simply our counterforce capability then the survival numbers, the general survival percentages that I gave you according to these studies would more than double.

Senator NUNN. You said 40-percent survival under general laydowns; is that right?

General GIUFFRIDA. That is correct, Senator Nunn.

Senator NUNN. Is that population or is that taking into account the economy and means of production? What is that 40 percent?

General GIUFFRIDA. That is population, Senator Nunn.

Senator WARNER. Is there somewhat of a correlation, as Senator Nunn points, between the infrastructure?

General GIUFFRIDA. No, that is what we are trying to build. There is not yet in place, for example, a key worker protection plan or vital industry protection plan—vital needs of the industry that would provide for the needs of the military and also provide essential minimum needs for the civilian part of the Nation.

Senator WARNER. Now, that is present in the Soviet Union, those programs.

General GIUFFRIDA. To the best of our knowledge, that is correct.

Senator WARNER. And the administration has not come forward to initiate such programs here.

General GIUFFRIDA. This year the first phase of the program is to get us to the general population protection and to do the necessary determination of what constitutes the vital industries as defined by the Department of Defense, and what are the vital industries that are required to take care of critical civilian needs.

There is in place a mechanism to adjudicate those requirements but there is not yet in place the second phase of the program which would be, the President makes a decision that says, "I want to implement this portion of the program."

We were supposed to provide him enough data so that he could make a decision, "go/do not go," with the second phase of it.

Senator WARNER. Could you give us, for the record if you do not have it, the comparison between your request this year and what the Soviets projected to expend for the same fiscal period?

General GIUFFRIDA. Yes sir, we can provide for the record an estimate but not precise numbers.

Senator WARNER. What do you think it would be?

One of your colleagues seems to be helpful.

General GIUFFRIDA. He is talking about a number that we have been discussing with DOD and with the intelligence community, Mr. Chairman. It is somewhere in the vicinity of $2½ to $3 billion.

Senator WARNER. Wait a minute. Excuse me, what was that?

General GIUFFRIDA. General Stilwell mentioned "Soviet Military Power," that was published recently by DOD. We have been talking to DOD estimators and also to the intelligence community. They center in on about $3 billion as the Soviet expenditure.

Senator WARNER. Three million?

General GIUFFRIDA. Three billion.

Senator WARNER. Per year.

General GIUFFRIDA. That is correct.

Senator WARNER. And they have been sustaining that level of funding for how many years?

General GIUFFRIDA. Well, they have had an intensive civil defense program for 30, 35 years as a minimum; maybe longer, 40 years.

Senator WARNER. And that curve is continuing to go up?

General GIUFFRIDA. Their curve has far exceeded ours all along. Their curve is now going up also.

Senator WARNER. We see no diminution, no leveling off?

General GIUFFRIDA. No, sir.

General STILWELL. We see no change. Mr. Chairman, in any of their curves of expenditures for any parts of what they consider war-fighting capability, offense, defense and the like.

It is important to note that the structure of their program is somewhat different than ours. They put inordinate emphasis on the protection of their political, military, and industrial managerial elite as the

first and most important thing, and then start worrying about the population.

General GIUFFRIDA. Theirs is unabashedly a war-survival program, Mr. Chairman, that looks at—as General Stilwell points out—initially the command and control structure. Our estimates are that they have specified which shift, which plants people will go to, critical workers.

The figures that we have, that both the general and I have addressed, do not address what we estimate as somewhere between two million volunteers that they have involved in their program within the Soviet Union—firemen and others—that have assigned volunteer civil defense functions.

Senator NUNN. May I ask a question, Mr. Chairman?

Senator WARNER. Yes.

U.S. SURVIVAL ESTIMATES

Senator NUNN. There are two or three lines of questioning I want to pursue, but let me ask one on the 40-percent figure again. Is that 40 percent of the people who survive the initial blast, or does that 40 percent include the people who are going to survive, let us say, a year, 2 years or more?

I am not trying to project the health effects of fallout.

General STILWELL. That includes fallout. All these figures include fallout, Senator Nunn.

Senator WARNER. And over what period of time? That is important, as the Senator says. I mean, is it 30 days, 60 days, 90 days?

General GIUFFRIDA. Sixty days is what we were working with, Senator.

Senator WARNER. Sixty days.

General GIUFFRIDA. Yes, sir.

Senator NUNN. Is that a period of time that is coordinated with all elements of the Department of Defense, or is this something you use just for emergency preparedness? Or is that a figure that is used throughout the Department of Defense?

General GIUFFRIDA. The Defense Department has been a key player in the determination of these fallout projections, the laydowns, survivals. FEMA does not do them in insolation. The initial studies were done when civil defense was in the Defense Civil Preparedness Agency, in the Department of Defense.

Senator NUNN. Mr. Chairman, I do not remember what was classified in that last hearing so I am not going to raise the next question. But I would like staff to reconcile the figures that we heard here today and what I think I heard in that last hearing.

Senator WARNER. Yes.

Senator NUNN. I am not sure whether my memory is correct. I will not pursue that if Frank could.

Senator WARNER. We will do that.

VOLUNTEERS IN CIVIL DEFENSE

Senator NUNN. The other thing I want to ask, General, you mentioned that the Soviets had about 2 million volunteers?

General GIUFFRIDA. That is correct, Senator.

[Additional information provided for the record:]

SOVIET CIVIL DEFENSE PERSONNEL

The 1978 study published by the Director of Central Intelligence, "Soviet Civil Defense," notes at page 8 that there are more than 100,000 full-time civil defense personnel in the USSR, but that "Counting all civilian units and formations . . . the total number of people in the program would be upwards of 16 million—a number that includes many perfunctory participants." The civilian units and formations include civilian groups for rescue, radiological defense, and other operational functions.

Senator NUNN. How many volunteers do we have today if the trigger went off? What kind of manpower quota do we have that you could say this morning in the United States would be available which has any element of preplanning or pretraining?

Senator WARNER. An organizational structure.

General GIUFFRIDA. We do not have any universal measurements throughout the United States. We have different levels of involvement. For example, Senator Warner, you will remember last year in the testimony here Jeanne Giles from Virginia who was one of your constituents.

Senator WARNER. Yes.

General GIUFFRIDA. She came in and spoke for the volunteer effort within Virginia. But that volunteer effort is really tied into something called the U.S. Civil Defense Council which has about 3,500 people.

Senator WARNER. That is the leadership more or less.

General GIUFFRIDA. Yes. They have a group that broke off several years ago, the American Civil Defense Association. There are other things that are coming together. For example, FEMA for the last 2 years has been actively encouraging a group called the American College of Emergency Physicians, the American Society of Emergency Professional Planners, and other things to kind of fertilize the area out there.

I think we have the same will on the part of the people, Senator Nunn, as has been demonstrated in other times to come forward and volunteer. What has been lacking is a cohesive program with which they could identify.

For example, in Atlanta you have Bill Smith who is doing on a local basis a very effective job of civil defense preparation. He has already identified volunteers in the private sector; heavy rescue kinds of things that could be called in. But that is a local thing that the city of Atlanta and the State of Georgia have been driving for in spite of the absence of a long-term finite program up here.

Senator NUNN. Well, what is the answer compared to that 2 million? What is it we have out there that we can say is organized and preplanned in terms of the manpower to do this job in an emergency? This morning, I am not talking about what may happen in 2 to 3 years.

General GIUFFRIDA. I cannot give you a precise figure now but I would say if we had to we could come up right now, by spreading out through disaster hires, through groups like the one in Virginia, the one in Atlanta, we could come up with 500,000 or 2 million volunteers.

Senator NUNN. They already know what they are supposed to do?

General GIUFFRIDA. No, they have already indicated that they would be available to us, some of whom we have used on a disaster-hire basis for natural disasters.

Senator NUNN. But if you did not have an organization and they did not have anywhere to report, you did not have a function, it would just be chaos, would it not, now?

General GIUFFRIDA. That is correct.

TRAINING NEEDED FOR VOLUNTEERS

Senator NUNN. Well, if you did have all the volunteers you needed, what kind of training—I am talking about an ideal world now where you could get what you wanted. What kind of training would they need to be able to carry out a meaningful function in the kind of emergency you are talking about?

General GIUFFRIDA. We already have in place, Senator, the training program. It depends upon—I will defer some of this to Mr. McLoughlin who is here with me and is the director of State and local programs and support directorate.

Radiological defense [Radef] training, shelter surveys, shelter management training, evacuation planning training. Dave, do you want to pick up?

Mr. MCLOUGHLIN. We have a need, Senator, for about 500,000 radiological monitors; for about 40,000 radiological defense officers, and something in the neighborhood of about 2 million people to manage fallout shelters.

We have a current capability—and I can give you additional numbers if you would like them for the record—but we have capability and training in the neighborhood of about 100,000 people per year through our training systems right now.

General GIUFFRIDA. Last year we did 108,000, Senator.

Senator NUNN. Let me ask you if you could give me—not this morning but you can furnish me for the record. This is strictly hypothetical now, I am not talking about resources that you are projecting. I am not giving you any boundaries on a 5-year plan or anything of that nature.

Let us assume that you could get all the manpower that you felt was necessary. First of all, give me the number necessary to carry out a comprehensive—and I am not talking about how many shelters you build or how much material you need.

General GIUFFRIDA. People.

Senator NUNN. I am talking about people. Then, the second question is if you can furnish me a rough idea of the skill level that those people would have to have.

General GIUFFRIDA. Yes, sir.

Senator NUNN. I am not talking about additional training now, I am talking about the skills you would be looking for. Whether you would be looking for people that were simply capable of a manual task or whether you would be looking for people who would be capable of radiological or some other sophisticated type of analysis.

So, some breakdown of the number—say 5 million. Some breakdown of the number of skilled people in that.

The third question is the degree of training those people would need in order to fulfill that function.

General GIUFFRIDA. Yes, sir.

(See questions submitted by Senator Nunn, p. 2628.)

POSSIBLE NATIONAL SERVICE PROGRAM

Senator NUNN. If you have, any other relevant information.

I will tell you what I am driving at. I have been convinced a long time and still am, we at some point in this country are going to need to go to some form of national service—whether it is military or whether it is a draft into the Reserves, or whether it is some other form. I know it is not going to happen in the next 2 years.

Now, if we had a national service program where every 18-year-old, let us say male and female in this kind of broad sweep—although I am not in favor of drafting women for the military—every 18-year-old had to do something.

One of the big impediments to that, when you start playing with models is what do they do if they do not go into the military? We do not need them all in the military, all of them are not qualified. If you had that kind of a situation, based on the quality of manpower we need, I think we would need the very best we could get in the military.

But let us assume you had 500,000 or 600,000 18-year-olds a year that were going to perform some form of national service. Let us assume that one of the forms of national service—if you stipulated they would be eligible for—would be some form of course in civil defense.

It would be their obligation to take that course; perhaps at no pay at all, perhaps on a purely noncompensation basis. Then it would be their obligation each year to go back and have updated training, or to go to so many civil defense drills in a year.

It seems to me, I do not believe we are ever going to get where we need to go with outlays in money, physical counted outlays. I believe it is going to be very difficult ever to get that kind of money.

But it seems to me we could put together a very comprehensive, manpower intensive, young person intensive civil defense organization that would be comprehensive, and that would foster some pride in the local community. These people would know what they were supposed to do and be available in an emergency, whether it is a nuclear war or whether it is a hurricane.

I have never really been able to get that kind of analysis from our Government. Are you capable of putting together something like that?

General GIUFFRIDA. We will sure give it our best shot, Senator. I would add, though, that it cannot be exclusively manpower. I mean, it would do us little good to have a predictable number of 18- or 19-year-olds coming into the system if we did not also have some of the essential stuff that it takes, the command and control equipment, the operating centers, the radiological instruments and all the rest of it. Those are dollars also.

Senator NUNN. Oh, I agree with that. I agree with that but I believe if you ever did undertake a national service program I think you could get the public more involved in it that way than any other way.

What I am saying is, manpower intensive. I am not saying manpower exclusive.

General GIUFFRIDA. All right. We will give it our best shot.

Senator NUNN. Do you know of any plan or study that has been done like that?

General GIUFFRIDA. Negative. I do not, sir.

Senator NUNN. I do not want to cause you to do 600,000 man-hours of work over there at your agency, but I do think we could get some kind of beginning on that. There are two or three national service studies going on now outside Government that are heavily funded.

It seems to me the very least we could do from a Government point of view is to plug in some meaningful planning.

General GIUFFRIDA. One of my staff, Senator, just handed me a note that says that there was a universal military service study done in 1966. We will break that out and update that. That was a DOD study.

Senator NUNN. What I am speaking of here is people who would not really necessarily have been in the military. You would not exclude people who had. You might use Guards, Reserves. You might use units of Reserve Forces that have very low readiness and equipment, very low training readiness; those kinds of things. But primarily people who would be civil defense oriented.

I do not know whether you would need 2 weeks of training, whether you would need 2 months of training; whether you would need 1 week of training. I do not know whether you would need them once a month to come to a certain center and practice what you are going to do, or do you need to do that once a week, I have no idea.

The parameters is what I am looking for.

General GIUFFRIDA. All right, we will get right on it, sir.

INTEGRATED EMERGENCY MANAGEMENT SYSTEM

General STILWELL. If I might interject, Senator Nunn, your concept of course would build squarely on the infrastructure of the integrated emergency management system that is now proposed.

Senator NUNN. Yes, I read this testimony. It seems to me that everything here would be consistent with something like that. Do you agree with that?

General STILWELL. Yes, sir.

Senator NUNN. Thank you, Mr. Chairman.

Senator WARNER. Thank you, Senator Nunn.

I am going to try and pose a question, and it is a sensitive one. But as we look at the Soviet Union and their civil defense program, General Stilwell said very clearly it is moving in the direction to protecting leadership, senior military, civilian, and industral leaders, economic capability to survive, and to some extent agriculture.

To those of us who have studied the Soviet system and the history of the Soviet Union and the discipline which the leadership inflicts upon their people, we can understand how they can invoke such a plan.

I am not certain that our approach here in the United States, beginning with the Declaration of Independence that all men are created equal, and so forth, that we can ever or should ever proceed in that direction.

So, maybe these comparisons between Soviet expenditures on civil defense and ours should take into account that diversity, the fundamental philosophy of the two civilizations.

I think to some extent our people would accept that we have to—to the extent we can—protect the President and those in the chain of command, at the time of a nuclear exchange. I doubt very much if Members of Congress even should be included, quite frankly. Of what value we would be at that point in time I personally—and I speak only for myself—question.

Senator NUNN. I suspect people would be glad to swap a Member of Congress for a doctor.

Senator WARNER. I think so.

General GIUFFRIDA. I think we need to talk about that, if I can jump in.

Senator WARNER. So, my point is that while we have this enormous disparity in expenditures we know, those of us who share in the intelligence briefings, why they are doing that and how they are doing it in some considerable detail. But we cannot expect a similar blueprint to be put on the United States.

STRATEGIC DEFENSES

General STILWELL. We must be conscious, Mr. Chairman, at all times of the mission, asymmetries, between the Soviet Union and ourselves. We discussed them a moment ago with respect to the design of forces. They have an offensive concept and design forces for that.

We design our forces essentially to deter and to render uncertain the outcome of any option that they would elect. Similarly, we have this asymmetry in what constitutes national will and resolve. In the Soviet Union it simply means the survivability of an illegitimate elite and the maintenance of themselves in power. Therefore, they focus on that.

National will and resolve in our country is, as you distinguished, "men no better than I," a function of the cohesion, esprit of our population.

This is what we believe and when we talk strategic defense—in addition to our passive means—we are talking about doing what we need to do to insure that the leadership of this country has behind it in moments of tension and crisis, a population which has confidence in its leadership and what it is going to do.

Part of that, it seems to me, is the ability under all the various scenarios of tension to insure a population that has the feel that there is a capability to prepare to do something as best we can in the event of impending disaster—whatever form that may take, including the threat of nuclear exchange.

So that a prudent expenditure and organization for planning, and preparations, is integral to the overall deterrent posture that we seek to achieve and maintain, and some reasonable efforts to protect the largest percentage possible of our population. To insure that, we also have to have the plans effected for their support as integral to the offense-defense mix we need for deterrence.

PRESERVATION OF CIVIL GOVERNMENT

General GIUFFRIDA. I would respectfully suggest, Senator, that the Congress in my judgment is certainly not expendable. If this country should ever face this cataclysmic disaster, its need would be to reconstitute itself again along the lines that we have survived for 200 years.

Fundamental to that is the clear and certain knowledge that this is still a civilian Government that has three distinctive branches of Government that share together the responsibility implicit in the whole Government, insuring the protection of the citizens and the continuation of that particular form of government.

I do not think that we could ever sell to the American people—I think they would categorically reject—a program that said, "We are going to take care of just the leadership and not take care of the public."

Furthermore, I think that would be inconsistent with the President's and this administration's definition of deterrence which is, as I have mentioned earlier, not simply a well-staffed and supported military establishment but also a system for continuity of Government and a protected population with critical skills, et cetera, et cetera.

The Integrated Emergency Management System to which General Stilwell and I alluded, and to which you and Senator Nunn have also referred, in fact will take us incrementally, in our judgment, to increasing levels of preparation and preparedness, and effective deterrence without ever having to model ourselves on, or clone, what the Soviet Union has done in that respect.

MULTIYEAR PROGRAM

Senator NUNN. How far down the line do you project budget wise, do you have a 5-year plan? You asked for this year how much?

General GIUFFRIDA. I think the number, Senator, is $253.5 million.

Senator NUNN. How much did you actually get last year as opposed to what you requested?

General GIUFFRIDA. Last year we asked for about the same number and got $147.4 million.

Senator NUNN. What is your 1985 budget projection?

General GIUFFRIDA. For 1985, it is $345 million.

Senator NUNN. How about 1986?

General GIUFFRIDA. That is $410 million.

Senator NUNN. And for 1987?

General GIUFFRIDA. $700 million.

Senator NUNN. And for 1988?

General GIUFFRIDA. Excuse me, that is $500 million in 1987 and in 1988 it is $600 million.

Senator NUNN. Does it level off at some point or does that depend on all these plans you are developing? I was just saying, how far can you really forecast? Let us say the 1990 fiscal year budget is contingent on the plans we develop here, how much of it is something you can really forecast?

General GIUFFRIDA. Well, if we went into the kind—and I am hesitating so I can choose my words carefully—but if we went into the kind of program that Senator Warner and you were addressing earlier on protection of vital industries and things of that sort——

Senator WARNER. I was not suggesting any program. I was asking in the context of what the Soviets are doing.

General GIUFFRIDA. I am not suggesting that you were. If the Government goes to the point of implementing a plan for protection of vital industries with all that that involves in terms of the degree of protection that you require, then that number would go up.

That is the decision that the President was supposed to be equipped to make. The level-off cost, then the maintenance cost, the best guess now, Senator Nunn, would be somewhere in the vicinity of $400 to $425 million.

Senator NUNN. That would simply concentrate on evacuation and protecting the public.

General GIUFFRIDA. That is if we put into place the Integrated Emergency Management System that we have been talking about, with all of the common elements that address any type of emergency on a scale of 1 to 10 from natural disasters up to nuclear war. That is correct.

Senator WARNER. General, tell me of your time schedule here.

General GIUFFRIDA. With your and Senator Nunn's indulgence I will leave in about 2 or 3 minutes.

Senator WARNER. All right. of course. I think you better go now.

General GIUFFRIDA. All right, sir. I have here people, when you get to the Integrated Emergency Management System with the panel, these people are here.

Thank you very much, Senator Warner.

Senator WARNER. Fine, thank you very much.

Senator NUNN. Just give me some idea about that information I requested.

General GIUFFRIDA. Yes, sir.

CIVIL DEFENSE TRAINING

Senator NUNN. Maybe you ought to get back and let me know how much time. I do not want to cause you to do a horrendous amount of work but I do want something we can at least have as a planning document that can be plugged into what other people are doing.

General GIUFFRIDA. We are in good shape to start on that, Senator. Last year in our resident program with the National Emergency Training Center at Emmitsburg and an outreach program, we increased by five times the number of people; we went up to 180,000 people with various kinds of programs.

So, we will put the NETC and our Washington planners on that right now.

Senator WARNER. We proceeded with questions of a very general nature this morning because I felt it important to get as a part of the record answers made in response to inquiries by our colleagues. So, forgive us, we will have more specific questions for the record that get into the detailed budgeting.

[Questions with answers supplied, follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN W. WARNER

CONSISTENCY OF DUAL-USE WITH NUCLEAR ATTACK PREPAREDNESS

Senator WARNER. General Giuffrida would you once again assure the committee that the planning now being perf' med to improve our preparedness for natural disasters is—to the extent such work is being accomplished with civil defense funding—consistent with requirements of nuclear attack-related preparedness? As you have indicated, such compatibility was stipulated in the fiscal year 1982 Defense authorization bill.

General GIUFFRIDA. All planning and other preparedness activities accomplished with civil defense funding improve our preparedness for possible nuclear attack. Virtually all of the items in the fiscal year 1984 request would also strengthen our capability to deal with the natural disasters, technological hazards, and other domestic emergencies which occur frequently. The multiple-hazard applicability of civil defense preparations is the underlying basis for the Integrated Emergency Management System (IEMS) approach outlined in my statement for the record. It is in accord with the Civil Defense Act, in particular the 1980 and 1981 amendments, as well as the 1982 National Security Decision Directive on civil defense. As noted in the statement submitted for the record, FEMA is acting to maximize the multiple-hazards payoff of all elements of the program. Thus the current shelter survey will be broadened to identify protection against hurricanes, tornadoes, and other threats as well as nuclear attack effects; relocation plans will be modified to take into account all types of hazards requiring evacuation; and Radiological Defense Officers will expand their ability to plan for and respond to all radiological hazards, such as major transportation accidents or other incidents that have potential for release of radioactive materials, and accidents at nuclear power plants.

IN-PLACE SHELTER PLAN REVIEW

Senator WARNER. General Giuffrida, I understand that a comprehensive review of in-place shelter plans was conducted at the end of Fiscal Year 1982. Would you provide for the record a detailed summary of the findings of this review? Did it constitute as well an assessment of the condition, availability, and appropriateness of such shelters for nuclear attack protection.

General GIUFFRIDA. In the mid-1960's, a program was initiated to develop community shelter plans to protect the American population in-place from fallout gamma radiation resulting from a nuclear attack. Data based on surveys of existing buildings which identified the fallout protection available was used for this planning. Over the years most of these plans became outdated and obsolete because of population changes, new buildings being constructed and old ones torn down. As part of the Crisis Relocation Plan development, many State planners updated the jurisdictions' community shelter plans (i.e., in-place protection plans) especially in host areas. The review made at the end of Fiscal Year 1982 involved determining the status of the in-place planning updating efforts (i.e., those in-place plans written or updated since 1976) that had been accomplished. It was determined that of some 3,605 planning areas requiring in-place shelter plans, 1,381 jurisdictions had developed updated allocations of their population to specific shelter facilities and had developed standby emergency public information materials on these allocations (38 percent of requirements involving approximately 34 percent of the population). Actual plans covering procedures for direction and control of shelter operations, warning, movement, and stocking of emergency supplies had been completed in 835 jurisdictions (23 percent of requirements covering about 20 percent of the population).

The review conducted at the end of fiscal year 1982 did not make any assessment of the condition, availability, and appropriateness of such shelters for nuclear attack protection. There are only two basic approaches for increasing population survival should a nuclear exchange ever occur. One is to construct blast shelters to protect people in-place to resist the blast and thermal effects close in to "ground zero." The other is to evacuate possible target areas over a period of several days, during an acute international crisis, and to provide fallout protection for evacuees and residents in host areas. The United States has opted for the evacuation approach. Alternative plans would also be made to protect people in-place using best available protection in existing buildings, if time or

circumstances preclude evacuation. Obviously, most buildings which have inherent fallout protection, do not provide significant levels of protection against the blast and thermal effects of a nuclear explosion. Therefore, the alternative in-place protection option using existing buildings does not provide the life saving potential that is available under an evacuation approach.

However, it should be noted that the fallout protection available in existing buildings is inherent in the building design and does not "disintegrate" over a period of time unless structural changes have been made to the building. As long as the building remains in existence, the protection is there. But such protection is available only for fallout gamma radiation and not for blast. For this reason, in-place shelter plans are not the complete answer for nuclear attack protection. In-place fallout shelters can only provide protection if they are located some distance away from the nuclear detonation.

INEFFECTIVE MEASURES ESCHEWED

Senator WARNER. General Giuffrida, in your statement you indicate that one of the reasons why the full $253.5 million requested for the civil defense program is necessary for the emphasizing of the "implementation of emergency management measures which are known to be effective." What emergency management measures that have been pursued in the past have been identified as being effectual?

General GIUFFRIDA. Measures which are known to be effectual include, among others, State and local Emergency Operating Centers and telecommunications and warning systems; protected broadcast stations; radiological defense systems, including trained personnel, plans and instruments; and civil defense emergency plans, for both in-place protection and evacuation, the latter where the nature of the threatened hazard provides time for moving people away from a threat. The utility of these and related measures has been demonstrated repeatedly in hurricanes, hazardous material releases, tornadoes, and other domestic emergencies. Some of these incidents were noted in my statement, for example, the December 1982 chemical threat in Taft, Louisiana, where the evacuation plan developed for a possible accident at the Waterford nuclear powerplant was used to evacuate 17,000 people from the chemical threat.

ALTERNATIVE SOURCES OF FUNDING FOR CRISIS RELOCATION PLANNING

Senator WARNER. General Giuffrida, I understand from your submitted statement that existing crisis relocation plans predicated upon a nuclear attack are being modified to take into account all-hazard scenarios. To what extent could funding be provided for such modification of existing nuclear attack-related crisis relocation models from sources other than the civil defense program?

General GIUFFRIDA. The potential impact of the Integrated Emergency Management System (IEMS) is more significant than merely modifying existing Crisis Relocation Plans to take into account all hazard scenarios. Where in the past, evacuation or in-place protection plans have been developed for such technological and natural hazards as hurricanes, floods, fixed nuclear facilities, etc., we see those plans providing a base for modification to serve other hazard scenarios including nuclear attack. In future starts of evacuation or in-place population protection planning we intend to implement the various planning assistance activities in a more complementary fashion so as to produce in one coordinated planning effort a comprehensive plan that addresses like functions in a generic approach, and distinctly addresses the features that are hazard specific. Thus, funding for what had been called CRP will contribute to preparedness through planning for all hazards and similarly other funding and assistance that had been previously delivered specifically for hurricane, earthquake, technological hazards, etc., will contribute to preparedness through planning for nuclear attack. In neither instance does the IEMS approach detract from the development of any of the hazard specific objectives. Rather by the integration of our total effort we are realistically supporting the overall development of a community's emergency capability to save lives regardless of the cause of the event, and that capability to protect people recognizes the only two options available regardless of the hazard, namely move or seek protective shelter. This is fundamental to the necessity for, practicality of and cost effectiveness to be derived from IEMS. It dramatically serves to implement the legislative mandate in Section 502 wherein it says the President shall implement an improved civil defense program which includes criteria and procedures

for attack-related civil defense and those planned for disaster-related civil defense can be used interchangeably.

NONCOOPERATION OF HOSPITALS IN CIVIL DEFENSE PREPAREDNESS

Senator WARNER. General Giuffrida, could you provide the committee for the record with a breakout of the number of American hospitals which have refused to participate in nuclear attack-related population care as a matter of policy, intended to protest increased preparedness for such an eventuality?

General GIUFFRIDA. We have not received any reports of American hospitals which have refused to participate in nuclear attack-related population care as a matter of policy. We believe that the question may refer to response to a program of the Department of Defense to request hospitals to make beds available for military casualties from an overseas conflict. We understand that the program was to provide care for military casualties in a conventional, not nuclear, conflict but questions on that program should be addressed to the Department of Defense.

UPCOMING FUNDING DECISION

Senator WARNER. General Giuffrida, in the Department of Defense oversight paper sent to the Congress in February, it was indicated that funding decisions would be made on industrial protection and blast protection programs. When will such decision be made and on the basis of what data not currently available?

Would you provide a range of estimates for the possible levels of funding that would be associated with these programs depending on conclusions reached in the course of the present reviews?

General GIUFFRIDA. The FEMA responsibility to which the Department of Defense February oversight report to the Congress refers relates to the United States policy set forth generally in the National Security Decision Directive–47 dated July 22, 1982. That policy requires that ". . . we have a capability to mobilize industry in order to achieve timely and sufficient production of military and essential civilian material needed to prosecute successfully a major military conflict, to lend credibility to national strategic policy, and to respond to national security emergencies." A broader statement is provided in terms of the anticipated outcomes of the implementation of this policy.

NSDD–47 makes reference to the 1982 NSDD on U.S. Civil Defense Policy. The tasks delineated here are quite specific. Our responsibility is to complete preparations and analyses which will allow for a) a funding decision to be made on a program to protect key or essential defense and population relocation support industries, and b) a funding decision on blast shelters for key industrial workers in defense and population relocation support industries.

We established the Industrial Protection Division in March, 1982. It administers the Protection of Industrial Capability (PIC) program. In response to the NSDD requirements, the Division has initiated pertinent activities and the PIC program is still in the analytic phase. One of the outcomes of that analytic activity will be to provide the Administration with options for determining how best to deploy a PIC program. We will provide a briefing for designated officials of the administration. The date for that briefing is classified. Obviously, the decision being an outcome of the briefing, the date for the decision is also classified.

Data upon which the decision will be made that is not currently available includes: a) actual shelter construction cost experience and analyses; b) the closing of critical countermeasure and other research gaps; c) the completion of the analyses and establishment of criteria for identifying essential industries and keyworkers. Information will also be gathered relative to their locations and numbers so that program cost analyses may be completed; and d) completing program concept feasibility so that, irrespective of the program deployment option selected by the administration, the support of industry will be a reasonable expectation.

We expect that the work outlined above will result in a range of industrial protection options of varying costs based on their content and characteristics. Because much of the analytic work remains to be completed, we are not yet able to provide even initial estimates on possible funding levels.

WATERFORD, LA., EVACUATION EXPERIENCE

Senator WARNER. General Giuffrida, you mentioned in your statement the fact that one of your crisis relocation plans was put to the test in December 1982,

following a threatened chemical release. Would you elaborate upon the incident in question, the experience gleaned from application of the crisis relocation plan to this problem and the "scalability" of that experience in other crisis relocation scenarios?

General GIUFFRIDA. The evacuation you refer to occurred early in the morning of October 12, 1982, in Taft, Louisiana. Officials at a nearby chemical plant informed the local government Department of Emergency Preparedness at the Emergency Operating Center in St. Charles Parish that the temperature in two large vats containing the poisonous chemical Acrolein was rising to dangerous levels. This posed a potential threat to the surrounding community (including an industrial area, residential community, and the Waterford III nuclear power reactor). The Director of the Department of Emergency Services subsequently alerted his staff and they began reviewing emergency procedures.

By 5 a.m., the situation became critical, and local officials directed implementation of an evacuation plan recently completed for the Waterford III nuclear reactor. The evacuation plan had not been developed for nuclear attack purposes but for a nuclear reactor accident which might impact on the nearby community. The citizens of the community were alerted of the danger and the need to evacuate through the use of the Emergency Broadcast System and by door-to-door alerting on the part of the police and volunteer firemen as called for in the plan. Even the bedridden were removed by ambulance.

Within 2½ hours, some 17,000 people had been evacuated from the surrounding five-mile area without a single accident, traffic tie-up, or other mishap. The speed of the evacuation was surprising even to local officials especially since it was conducted under extremely adverse conditions in a driving rain and thunderstorm at five o'clock in the morning. Success was attributed to having recently developed an evacuation plan (for the Waterford III nuclear reactor), training of emergency preparedness staff, and an emergency operating center with excellent communications (built using FEMA matching funds).

In September 1979, when Hurricane David approached the Georgia coast, approximately 25,000 citizens of Brunswick, Ga., and the low lying barrier islands were evacuated from their homes. In this case, a Crisis Relocation Plan had recently been completed for the area and public information materials identifying roads to be used by specific sectors of the community and evacuee reception centers were readily available. This information was disseminated to the public and was credited with facilitating the evacuation by local and State officials.

These and other examples of evacuation being used as a protective life saving action for peacetime emergencies provide a positive basis for expectation that evacuation is also a viable option for protection against nuclear attack. During the past ten years, although our records are incomplete, we can identify at least 133 locations where peacetime evacuations were implemented in the United States involving approximately 1.2 million evacuees. These evacuations have generally been on a smaller scale than those envisioned for nuclear attack purposes and did not involve the massive movement of people and supporting resources (e.g., food, fuel, and pharmaceuticals). FEMA believes that with adequate planning and development of operational systems (i.e., the facilities, equipment, supplies, training, and infrastructure needed to make the plan work), the more difficult evacuations for nuclear attack can also be accomplished.

POPULAR SENTIMENT REGARDING CIVIL DEFENSE

Senator WARNER. General Giuffrida, I understand that numerous polls of the American people have reflected a fairly constant level of interest in maintenance of a civil defense capability. In fact, many people in this country seem to believe that a fairly competent civil defense capability is in place today. Can you provide for the record any such data that you have available to you?

General GIUFFRIDA. Professionally conducted opinion surveys over the years have indeed reflected a fairly constant, and fairly high level of interest on the part of the American people in maintaining a civil defense capability.

Most recently, in 1982, the Gallup organization conducted several national-sample surveys for FEMA on civil defense related issues (detailed summaries of these polls are attached for inclusion in the record). Briefly, the more notable conclusions derived from these recent surveys are that:

(1) A majority of Americans believe that the United States needs a civil defense program to protect people in the event of an attack.

(2) Three-quarters of adult Americans believe that building up the Nation's civil defense program either makes nuclear war less likely or has no effect on its likelihood.

(3) About three-fifths disagree with the thought that a stronger U.S. civil defense program might "make people think that a nuclear war could be survived like any other war."

(4) Most Americans do not believe that an improved civil defense might lead the Soviets to believe that the United States is preparing to launch an attack.

(5) By a three to two margin, Americans approve of Administration proposals to increase civil defense spending.

(6) About two-thirds of adult Americans approve of the idea of government planning to evacuate people who live in high risk areas in the case of a tense international situation.

(7) Most Americans believe that the development of plans to cope with nuclear war would be helpful in dealing with common peacetime disasters.

FEDERAL EMERGENCY MANAGEMENT AGENCY,
Washington, D.C., Wednesday, July 21, 1982.

BACKGROUNDER: CIVIL DEFENSE SURVEYS

A majority of Americans believe the United States needs a civil defense program to protect people in case of an attack. In addition, about two-thirds of adult Americans approve of the idea of government planning to relocate who live in high risk areas in case of a tense international situation.

These are the two key findings to emerge from a public opinion survey conducted by the Gallup Organization of Princeton, N.J., on behalf of the Federal Emergency Management Agency. FEMA is responsible for the national civil defense program.

The information was obtained by Gallup interviews with 1,023 adults aged 18 or over during the period May 24 to June 13, 1982, in a telephone sample.

The Gallup poll reports that "about three times as many adults would disapprove (59%) than approve (18%) of the Federal Government ending the civil defense program entirely." (See Question 1.)[1]

To a related question, those persons queried indicated by a three to two margin their approval of President Reagan's decision to increase civil defense spending. (Question 2.)

Regarding planning for relocation of people from high risk areas during an international crisis, the poll found that "two-thirds (67%) of adults approved of the United States having such a plan, with 19 percent voicing disapproval." (Question 3.)

A substantial lack of knowledge about civil defense was also shown by the Gallup survey. The poll sample was asked whether the United States currently has population evacuation plans. A fifth of adults (21%) say the government definitely has plans to relocate people in the event of a crisis which might lead to war, and another fifth (22%) think they do. A third (34%) believe the government does not have such plans, and 23 percent say they don't know. (Question 7.)

The results reported by Gallup were consistent in many respects with two other 1982 public opinion polls. The two polls were ABC–TV's poll of April 8–10, and NBC–TV's poll of March 29–30.

For example, the ABC poll asked if respondents approved or disapproved of the government's plan to evacuate American cities if a nuclear attack appeared likely? The response was: 59 percent approved; 33 percent disapproved; and 8 percent unsure.

The same poll asked if the respondents approved of an increase in civil defense spending? The response was: 51 percent approved; 41 percent disapproved; 8 percent unsure.

Their answer to a question about how good are civil defense plans resulted in respondents saying: 2 percent excellent; 27 percent good; 31 percent not so good; 32 percent poor.

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[1] The text of all questions, and Gallup's findings, appear at the end of this Backgrounder.

The latter is in line with the administration's assessment that civil defense plans are not adequate, which is why the President has proposed his seven-year civil defense program.

The NBC poll asked the question: "Some people say that the United States should not make plans for people to survive a nuclear war because such planning increases the chances of a nuclear war. What about you? Do you agree or disagree with this view?" The NBC poll found: 56 percent said such planning should be done anyway; 31 percent opposed the planning; 13 percent were not sure.

The questions used in Gallup's civil defense survey of May–June 1982 and Gallup's summary of findings are quoted below:

GALLUP'S SURVEY ON CIVIL DEFENSE: MAY–JUNE 1982

Question 1: Suppose the federal government decided to end the civil defense program entirely. How strongly would you approve or disapprove of that decision?

Fifty-nine percent disapprove; 18 percent approve; 8 percent ambivalent; 8 percent don't feel they know enough about the civil defense; 7 percent don't know how they would feel if this took place.

Question 2: President Reagan recently decided that the government should increase spending for civil defense. How strongly do you approve or disapprove of that decision?

Fifty percent approve; 34 percent disapprove; 9 percent neutral; 7 percent don't know.

Question 3: How strongly do you agree or disagree that the United States should have a relocation plan?

Sixty-seven percent approve; 19 percent disapprove; 5 percent neither approve nor disapprove; 9 percent don't know.

Question 4: Suppose that in a tense international situation which might lead to war it was the government's policy to relocate people who live in large cities and people who live in communities near military installations. How strongly would you approve or disapprove of this policy?

Thirty-four percent strongly approve; 27 percent somewhat approve; 21 percent disapprove; 8 percent neutral; 10 percent don't know.

Question 5: Suppose the President received word that the Russians had begun evacuating their cities and based on this information he urged relocation of the people living in some of our areas. How likely would you be to leave your area or go somewhere else if the President told you to go?

Forty-one percent very likely to go; 23 percent somewhat likely to go; 10 percent somewhat unlikely to go; 18 percent very unlikely to go; 8 percent don't know what they would do.

Question 6: If you were told that the government had prepared plans to relocate you and your family during a crisis, how likely would you be to follow those plans if your local civil defense officials told you to go?

Forty-seven percent very likely to follow relocation instructions; 24 percent somewhat likely; 9 percent somewhat unlikely; 12 percent very unlikely; 8 percent don't know.

Question 7: As far as you know, do we, in the United States, currently have plans to relocate people from large cities and other risk areas in the event of a crisis which might lead to war?

Twenty-one percent say the government definitely has plans; 22 percent think the government has such plans; 34 percent believe the government does not have plans; 23 percent don't know.

Question 8: Some people say relocation from our large cities would be impossible because of traffic problems. Other people point out that about one-fourth of the population in most large cities commute twice each day during a two-hour rush period. Thinking about your area and the size of the population, how many days do you think it would take to evacuate most of the people who are there?

Nineteen percent say it would take one day; 15 percent say it would take two days; 14 percent say it would take three days; 6 percent say it would take four days; 24 percent say it would take five or more days; 4 percent say it couldn't be done at all; 18 percent don't know.

Question 9: Some people think the government has a civil defense program mainly because it will save lives. Other people think the government has the program because it shows an enemy that we are prepared and will keep them

from military action. Which reason do you think the government has for keeping its civil defense program?

Thirty-two percent say we have the program because it saves lives; 32 percent say we have it because it shows the enemy we are prepared; 23 percent say both reasons are involved equally; 4 percent say neither is the reason; 9 percent don't know.

Question 10: Thinking about the possibility of war or a natural disaster, what do you think is the one most important thing the government should provide for people as part of the civil defense program?

Thirty-five percent in-place shelters; 7 percent information in advance; 7 percent safe food and water; 6 percent medical help; 4 percent a warning system; 3 percent a relocation plan; 8 percent mentioned other items as being important; 30 percent don't know.

FEDERAL EMERGENCY MANAGEMENT AGENCY,
Washington, D.C., October 18, 1982.

BACKGROUNDER: RESULTS OF SECOND GALLUP CIVIL DEFENSE SURVEY

WASHINGTON.—Three-quarters of adult Americans believe that building up the Nation's civil defense program either makes nuclear war less likely or has no effect on its likelihood. In addition, a majority believe the development of plans to cope with nuclear war are helpful in dealing with common peacetime disasters.

These are two key findings to emerge from a follow-up public option survey conducted during the period Aug. 28 to Sept. 12, 1982, by the Gallup Organization of Princeton, N.J., for the Federal Emergency Management Agency (FEMA). An earlier Gallup poll, conducted from May 24 to June 18, 1982, found that a majority of Americans believe the United States needs a civil defense program to protect people in case of an attack.

Civil defense is among FEMA's major program areas. The agency also deals with a wide variety of natural and technological disasters and emergencies in peacetime.

Information for the second Gallup survey was obtained from telephone sample interviews with 1,030 adults aged 18 or older.

Gallup reports that when respondents were asked whether they believe building up our civil defense program would make nuclear war more likely or less likely, the greatest number (42 percent) said "it would make no difference." Thirty-three percent said it would make nuclear attack "less likely", and 17 percent said it would make an attack "more likely." (See Question 12.)[1]

Regarding the usefulness of civil defense plans for other disasters and emergencies, 60 percent of the respondents believe these plans are helpful; 23 percent said they would "help very much," and 37 percent said they would "help somewhat." (Question 8.) These results are consistent with the emphasis in the administration's program on using civil defense plans and systems to respond more effectively to common disasters like floods, hurricanes and tornadoes.

A question asked in the first Gallup survey on the reaction of citizens to relocation advice from local officials was repeated in this follow-up survey. In the first survey, 47 percent of the people said they would be "very likely to follow relocation instructions" in the event of a threatened nuclear strike, 24 percent said they would be "somewhat likely" to do so, 9 percent said they would be "somewhat unlikely to comply", and 12 percent said they would be "very unlikely" to do so.

In the follow-up survey, the results were nearly equivalent. Forty-nine percent said they would be "very likely" to follow the plans, 20 percent said they would be "somewhat likely," and 13 percent said there is a "50/50 chance" that they would follow the plans. (Question 9.) In a related question, half of the respondents say they may leave home on their own without waiting for local officials' advice in such a situation. (Question 10.)

Regarding the threat of a peacetime disaster, 58 percent of the adults surveyed said they would be very (44 percent) or somewhat (14 percent) likely to leave on their own if they heard that a disaster other than war threatened their community. (Question 3.)

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[1] The text of all Gallup questions and data findings appear at the end of this Backgrounder.

The Gallup poll also dealt with the possibility of nuclear war somewhere in the world within the next five years. Half of the adult respondents believe there is at least a "50/50 chance" that it might occur, while 44 percent believe it is unlikely to occur. (Question 6.)

The questions used in Gallup's civil defense survey and a summary of its findings follow.

GALLUP'S SURVEY ON CIVIL DEFENSE: AUGUST–SEPTEMBER 1982

Question 1: As best as you can recall, what types of disasters, if any, has your community ever experienced that made it necessary to evacuate some or all of its residents?

Six percent, hurricane; 7 percent, tornado; 17 percent, flood; 0.3 percent, dam failure; 1 percent, earthquake; 4 percent, chemical/toxic materials accident; 6 percent, fire; 2 percent, gas line break; 4 percent, other; 62 percent, none or don't know.

Question 2: What types of emergencies or disasters, if any, have made it necessary for you or other members of your household to evacuate your home?

Two percent, hurricane; 2 percent, tornado; 2 percent, flood; 0.2 percent, dam failure; 0.3 percent, earthquake; 0.5 percent, chemical/toxic materials accident; 4 percent, fire; 0.5 percent, gas line break; 1 percent, other; 89 percent, none or don't know.

Question 3: Suppose you heard that some sort of disaster—other than war—threatened your community and that it might be necessary for you to evacuate your home. How likely would you be to leave on your own and go someplace safer without waiting to be told to leave by officials?

Forty-four percent, very likely; 14 percent, somewhat likely; 18 percent, about a 50/50 chance; 8 percent, somewhat unlikely; 13 percent, very unlikely; 3 percent, don't know.

Question 4: I'm going to read you a list of disasters that might or might not occur in your area. For each one I would like you to tell me how likely it is that it might occur in the area where you live within the next five years.

[In percent]

Type of disaster	Very likely	Somewhat likely	50-50 chance	Somewhat unlikely	unlikely Very	Never	Don't know
Hurricane	12	8	6	13	44	14	3
Tornado	25	18	9	12	28	6	3
Flood	16	17	9	15	33	7	2
Dam failure	4	5	5	13	52	18	4
Earthquake	11	10	8	13	42	12	4
Chemical/toxic materials accident	17	23	15	12	23	8	3
Gasline break	19	29	16	10	18	5	4
Nuclear power plant accident	11	11	8	14	41	12	4

Question 5: Suppose the nation, including local officials, was well prepared with plans to deal with these peacetime disasters. How much do you think these plans would help us cope with a nuclear attack if one should ever occur?

Fifteen percent, help very much; 25 percent, help somewhat; 23 percent, help very little; 29 percent, not help at all; 9 percent, don't know.

Question 6: How likely do you think it is that a nuclear war might occur somewhere in the world within the next five years?

Thirteen percent, very likely; 18 percent, somewhat likely; 20 percent, 50/50 chance; 19 percent, somewhat unlikely; 25 percent, very unlikely; 6 percent, don't know.

Question 7: If there ever was a nuclear attack, how likely do you think it would be that the area in which you live would be the target of a nuclear weapon?

Thirty-one percent, very likely; 15 percent, somewhat likely; 13 percent, 50/50 chance; 14 percent, somewhat unlikely; 22 percent, very unlikely; 5 percent, don't know.

Question 8: If the nation was well prepared for civil defense against nuclear attack, including local plans, how much do you think that would help us to cope with other potential disasters?

Twenty-three percent, help very much; 37 percent, help somewhat; 16 percent, help very little; 14 percent, not help at all; 5 percent, depends on type of plans (volunteered); 6 percent, don't know.

Question 9: Suppose there was a tense international crisis that might lead to war/nuclear attack,[1] and you were told that the government had plans to relocate/try to take care of [1] you and your family. How likely would you be to follow those plans if your local civil defense official told you to go?

[In percent]

	Nuclear attack	War
Very likely	49	45
Somewhat likely	20	16
50–50 chance	13	18
Somewhat unlikely	5	6
Very unlikely	9	13
Don't know	4	3

Question 10: In a tense international crisis that might lead to war/nuclear attack, how likely would you be to leave your home on your own and go someplace safer without waiting for your local civil defense officials to tell you to leave?

[In percent]

	Nuclear attack	War
Very likely	33	34
Somewhat likely	16	17
50–50 chance	17	14
Somewhat unlikely	11	9
Very unlikely	19	25
Don't know	4	2

Question 11: If you saw your neighbors packing their cars to leave during a tense international crisis, how likely is it that you would also leave your home and go someplace else without waiting for your local civil defense officials to tell you to leave?

32 percent, very likely; 18 percent, somewhat likely; 16 percent, 50/50 chance; 10 percent, somewhat unlikely; 21 percent, very unlikely; 4 percent, don't know.

Question 12: Some people say that building up our civil defense program would make a nuclear war more likely, because it would make people think that a nuclear war could be survived like any other war, or that it might lead the Soviets to think we are preparing to launch an attack. Other people say that building up our civil defense program would make nuclear war less likely, because it would show the Soviets we are prepared. Which comes closest to the way you feel—that building up our civil defense program would make nuclear war more likely or less likely, or do you think it would make no difference?

17 percent, more likely; 33 percent, less likely; 42 percent, no difference; 8 percent, don't know.

FEDERAL EMERGENCY MANAGEMENT AGENCY,
December 28, 1982.

BACKGROUNDER: RESULTS OF THIRD GALLUP CIVIL DEFENSE SURVEY

About three-fifths (63%) of adult Americans disagree with the idea that a stronger U.S. civil defense program might "make people think that a nuclear war could be survived like any other war." Nor do they think (60%) that an improved civil defense "might lead the Soviets to believe we (the United States) are preparing to launch an attack." (Questions 8 and 9).[1]

[1] On these questions Gallup used the word "war" in half of the interviews and "nuclear attack" in the other half, and used the words "relocate"/"try to take care of" in the same way. This was done to test sensitivity to the various terms.

To a companion question, a majority of the same number of persons interviewed agreed that building up the U.S. civil defense program "would make a nuclear war less likely because it would show the Soviets that we are prepared." (Question 7.) [1]

These are key findings to emerge from the third and final public opinion survey on civil defense issues conducted during the period Oct. 8–25, 1982, by the Gallup Organization of Princeton, N.J. The results were based on telephone interviews with 1,037 adult Americans.

The public attitude study was conducted by Gallup for the Federal Emergency Management Agency. FEMA is responsible for the national civil defense program, as well as a wide variety of natural and technological disasters and emergencies in peacetime.

The results were generally consistent with two earlier 1982 public attitude surveys. In the first (May 24–June 13), Gallup found that a majority of Americans favor a civil defense program to protect people in case of an attack, and that two-thirds also support government planning to relocate people who may be at risk of attack in an international crisis.[2]

In the second survey (Aug. 28–Sept. 12), data showed that three-quarters of adult Americans believe that building up the nation's civil defense program either makes nuclear war less likely or has no effect on its likelihood.[2]

Respondents in the latest and last public attitude survey also approved (54 percent) the President's proposal for a government increase in civil defense spending, as compared with 20 percent) disapproving. (Question 4.)

Sixty percent indicated they were inclined to comply with the plans of local civil defense officials in an international crisis that might lead to nuclear attack. Another 21 percent said there was a 50–50 chance they would comply, while 12 percent said they were unlikely to do so. (Question 6.)

More than half (55 percent) of those interviewed felt civil defense plans for a nuclear attack would be helpful in the event of other disasters, while 30 percent said they would help very little or not at all. (Question 2.) By contrast, only 37 percent believed that plans for a natural disaster would be helpful in coping with a nuclear attack, while 50 percent said the natural disaster plans would help very little or not at all. (Question 1.)

The questions used in Gallup's civil defense survey and a summary of its findings follow.

GALLUP'S SURVEY ON CIVIL DEFENSE (OCT. 8–25, 1982)

Question 1: Suppose the nation was well prepared with plans, including local plans, to deal with natural disasters, nuclear power plant incidents and toxic materials spills. How much do you think these plans would help us cope with a nuclear attack if one should ever occur?

Twelve percent, help very much; 25 percent, help somewhat; 22 percent, help very little; 28 percent, not help at all; 13 percent, don't know.

Question 2: If the nation was well prepared for civil defense against nuclear attack, including local plans, how much do you think that would help us to cope with other potential disasters, such as natural disasters, nuclear power plant incidents, and toxic materials spills?

Eighteen percent, help very much; 37 percent, help somewhat; 16 percent, help very little; 14 percent, not help at all; 15 percent, don't know.

Question 3: Some people think we should have a civil defense program mainly because it will help save lives if a nuclear attack ever occurs. Other people think we should have a civil defense program because it shows an enemy that we are prepared and will make an attack less likely. Which reason do you think is the most important reason to have a civil defense program—to save lives or to show we are prepared?

Forty-eight percent, save lives; 23 percent, show we are prepared; 16 percent, both equally important; 5 percent, neither; 8 percent, don't know.

Question 4: The President recently proposed that the government should increase spending for civil defense. How strongly do you approve or disapprove of that decision?

[1] The text of all questions and Gallup's findings appear at the end of this Backgrounder.
[2] Reported in FEMA News Releases 82–64 of July 21, 1982, and 82–88 of October 18, 1982, respectively.

Twenty-four percent, strongly approve; 30 percent, somewhat approve; 13 percent, somewhat disapprove; 16 percent, strongly disapprove; 5 percent, neither approve nor disapprove; 4 percent, don't know enough about civil defense (volunteered); 8 percent, don't know.

Question 5: Thinking about the possibility of a war or a natural disaster, what do you think are the three most imporant things the government should provide for people as part of the civil defense program? (Top three recorded.)

Fifty-four percent, shelters near home or work; 15 percent, a relocation plan; 27 percent, a warning system; 54 percent, safe food and water; 38 percent, medical help; 21 percent, information in advance; 10 percent, other; 21 percent, don't know.

Question 6: Suppose there was a tense international crisis that might lead to a nuclear attack, and you were told that the government had plans to try to take care of you and your family. How likely would you be to follow those plans if your local civil defense officials told you to go?

Forty-two percent, very likely; 18 percent, somewhat likely; 21 percent, 50/50 chance; 4 percent, somewhat unlikely; 8 percent, very unlikely; 7 percent, don't know.

Some people say that building up our civil defense program would make a nuclear war more likely; other people say building up our civil defense program would make a nuclear war less likely. I'm going to read you three statements on this issue, and I'd like you to tell me how strongly you agree or disagree with each.

Question 7: Building up our civil defense program would make a nuclear war less likely because it would show the Soviets that we are prepared. Do you agree?

Twenty-three percent, strongly agree; 28 percent, somewhat agree; 16 percent, somewhat disagree; 16 percent, strongly disagree; 3 percent, neither agree nor disagree (volunteered); 4 percent, makes no difference (volunteered); 10 percent, don't know.

Question 8: Building up our civil defense program would make a nuclear war more likely because it would make people think that a nuclear war could be survived like any other war. Do you agree?

Seven percent, strongly agree; 14 percent, somewhat agree; 24 percent, somewhat disagree; 39 percent, strongly disagree; 2 percent, neither agree nor disagree (volunteered); 3 percent, makes no difference (volunteered); 11 percent, don't know.

Question 9: Building up our civil defense program would make a nuclear war more likely because it might lead the Soviets to think we are preparing to launch an attack. Do you agree?

Eight percent, strongly agree; 15 percent, somewhat agree; 24 percent, somewhat disagree; 36 percent, strongly disagree; 3 percent, neither agree nor disagree (volunteered); 4 percent, makes no difference (volunteered); 10 percent, don't know.

GAO REPORT ON FEMA PLANNING

Senator WARNER. Mr. Maguire, as you know, the General Accounting Office recently released a report that was somewhat critical of FEMA's civil defense planning. Would you comment at this time briefly and in greater detail for the record on this report and its findings?

Mr. MAGUIRE. The only recently released GAO report concerning civil defense was GGD 83–5, dated November 5, 1982, on Emergency Management Assistance funding for State and local personnel and administrative expenses. It did not deal specifically with civil defense planning. FEMA's comments on the GAO report were provided on January 5, 1983. A copy of the FEMA comments are attached.

JANUARY 5, 1983.

Mr. WILLIAM J. ANDERSON,
Director, General Government Division,
U.S. General Accounting Office, Washington, D.C.

DEAR MR. ANDERSON: This is in response to your letter, file B–208664, to me, dated November 10, 1982, enclosing two copies of your report GGD 83–5, to Congressman Allen B. Swift entitled "The Emergency Management Assistance Program Should Contribute More Directly to National Civil Defense Objectives."

A statement on actions taken by the Federal Emergency Management Agency with regard to the recommendations in this report has been sent to the Senate

Committee on Governmental Affairs, the House Committee on Government Operations, the House Committee on Appropriations and the Senate Committee on Appropriations. A copy of this statement is enclosed.

Sincerely,

LOUIS O. GIUFFRIDA,
Director.

Enclosure.

GAO REPORT, GOD 83–5, NOVEMBER 5, 1982, ENTITLED: THE EMERGENCY MANAGEMENT ASSISTANCE PROGRAM SHOULD CONTRIBUTE MORE DIRECTLY TO NATIONAL CIVIL DEFENSE OBJECTIVES

Specific comments by FEMA

Recommendation (page 12): The Director of FEMA should require each State as a part of its Emergency Management Assistance (EMA) Annual Submission to:

Identify those local jurisdictions in critical civil defense areas that do not participate in the EMA Program.

Address specifically how the State plans to attain participation of those local governments through such means as varying the EMA matching requirements within the State, adopting State distribution formulas as tools to encourage desired participation patterns, and/or giving priority funding consideration to jurisdictions in critical civil defense areas.

The Director of FEMA should review each State's Annual Submission to ensure that efforts are being made to fund local jurisdictions critical to the national civil defense effort.

Response.—Critical civil defense areas include, by law, "target and support areas as well as the areas which may be affected by natural disasters with respect to the development of the total civil defense readiness of the Nation." FEMA does provide the States with information that identifies their target or high-risk areas for attack. These designations change, however, from time-to-time and consequently alter the identification of host areas. The States, on the other hand, identify their support areas and have the greater experience and knowledge to recognize the natural-disaster-prone areas within their States. FEMA encourages all-hazards analyses by participants. Since all areas of the United States are vulnerable to natural disasters, and to a large extent are either "target and support" areas, we do not make distinctions among them as to which areas are most critical for civil defense. Also, we do not identify specific areas for concentration of EMA funding.

The report suggests that local participation could be increased by encouraging that the required nonfederal cost sharing (50 percent minimum) be met not by each local participant individually but by all collectively, along with the State; presumably this would enable EMA participation by jurisdictions that do not have enough funds for their share. FEMA does not oppose this but neither does it consider that this should be required.

FEMA requires only that its allocation to the State be at least matched. The nonfederal share can come from any source. How that share is to be made up and who is to supply it are State decisions—ideally to be made in concert with local jurisdictions. States and participating local governments have been reluctant to subsidize other jurisdictions. This is particularly so when the Federal share is less than half of the participants' needs. Although some jurisdictions provide for more than half of their costs, it does not follow that this produces a surplus that can be used by others; on the contrary, there is no State or local surplus but rather a Federal shortfall.

Nevertheless, FEMA agrees that "ability to pay" should not be the only standard for a State's suballocation of EMA funds to its localities.

FEMA will provide guidance to the State to consider all areas for funding, giving priority to jurisdictions in the following order:

Existing participants with a substantiated record of accomplishment in emergency management.

Jurisdictions considered more vulnerable to attack or to natural or technological disaster.

Jurisdictions expected to support those more vulnerable areas, either as reception areas or as primary suppliers of relief and recovery assistance.

Participants or proposed participants that meet FEMA's recommended standards for staffing and other capabilities.

Jurisdictions able to provide all or part of the non-federal cost-sharing for the program.

The FEMA Director will include the guidance criteria above in CPG 1–3, Federal Assistance Handbook, Chapter 2, Emergency Management Assistance Program, when it is published in final form during Calendar Year 1983. Emphasis will be placed on the review of State work plans to ensure that the States adhere to that guidance.

Recommendations (*page 28*).—The Director of FEMA should specify national objectives or standards for States to require local applicants to address in their annual funding proposals, depending on the unique needs and capabilities of each local jurisdiction. The Director of FEMA should also require States to use these national objectives or standards in their oversight and evaluation of local performance and consider local performance as a factor in their annual funding decisions.

Response.—The annual Program Emphasis paper is a means by which FEMA identifies the national program goals for the States and local governments, with the expectation that these goals will be reflected in the State and local program papers for the year. The Fiscal Year 1984 Program Emphasis paper, to be issued early in Calendar Year 1983, will be specific in defining national objectives needed to improve the overall civil defense effort. It will apply an all-hazards approach, including nuclear attack, especially for State and local planning. FEMA will be expecting the States to provide the program emphasis to each of its locals.

FEMA has required State recipients of Fiscal Year 1983 EMA funds to address specific national emergency management objectives in their annual statements of work as a part of their application package. FEMA intends to continue this requirement.

DAMAGE ESTIMATES FOR NUCLEAR ATTACKS

Senator WARNER. General Giuffrida, compare the magnitude of the damage inflicted in a pre-emptive counterforce by the USSR versus that inflicted by a retaliatory strike on the Soviet Union by the United States.

Does a disparity there affect deterrence?

General GIUFFRIDA. A preemptive counterforce attack could include attacks on such objectives as intercontinental ballistic missile complexes, Strategic Air Command bases, and ballistic missile submarine ports. Studies have estimated that in such an attack, nationwide fatalities could approximate 5 percent of the U.S. population, given the current civil defense system. Most of the estimated fatalities would be from fallout radiation, in areas downwind from the counterforce objectives directly attacked.

It is important to note that estimates of fatalities are sensitive to assumptions made regarding the exact weight and nature of the attack and the protection available to (and used by) the population. For example, the 5 percent estimate was based on an assumed attack on 47 counterforce installations, and on an assumed short warning period, so that people in areas where fallout was deposited had time only to take shelter in home basements if available, otherwise in upper stories.

Fatalities would be significantly lower if people took shelter in the best protection available in larger buildings in their vicinity, where they did not have home basements. They would be much lower still, if time had permitted pre-attack evacuation of counterforce areas, and the development of additional fallout protection for people in areas experiencing fallout deposition. On the other hand, fatalities would be substantially higher if people did not seek shelter in home basements, where available, but remained upstairs in their houses, and would also be higher if additional military objectives were attacked.

FEMA therefore believes that the importance of such studies is in indicating relative rather than absolute results. This is because actual fatalities could be either more or less than the results indicated by any given study, depending on factors such as those just outlined (attack characteristics and protection available to the population).

A large-scale attack on U.S. urban/industrial objectives, in addition to counterforce and other military installations, would result in far greater fatalities than an attack on counterforce objectives alone. Studies have estimated that such a large-scale attack in the mid–1980's would result in fatalities on the order of 60 percent of the U.S. population, given current civil defense capabilities.

FEMA does not assess the damage that would result from U.S. attacks on the Soviet Union. However, a 1978 unclassified report by the Director of Central Intelligence, "Soviet Civil Defense," did include such estimates. For an assumed U.S. retaliatory strike on high-value military and economic targets, Soviet population fatalities were estimated to vary from "well over 100 million" (more than half of which would be fatalities) given warning of only a few hours, to the "low tens of millions, about half of which would be fatalities," given a week or more to evacuate Soviet cities and to protect the evacuated population. The DCI report states that such estimates would be larger if other assumptions were used, for example, a larger attack directed at more targets.

FEMA does not assess the effect on deterrence of disparities in estimated survival in the event of a possible nuclear exchange. However, General Richard G. Stilwell, USA (Ret.), Deputy Under Secretary of Defense for Policy, noted in his March 23, 1983, statement to the committee that the fiscal year 1984 civil defense program proposed by FEMA ". . . is an integral part of our deterrent posture. . . . As a wartime capability for reducing . . . the anticipated number of prompt fatalities—it complements our military efforts to make war less likely."

Secretary of Defense Weinberger, in his February 11, 1983, report to the committee, said that the fiscal year 1984 programs ". . . fully supports and is consistent with the civil defense policy guidelines prescribed by the President." These policies include enhancing deterrence and stability, in conjunction with our strategic offensive and other strategic defensive forces, as well as reducing the possibility that the United States could be coerced in time of crisis. These policies are essentially the same as those included by the Congress in 1980 amendments to the Federal Civil Defense Act (50 U.S.C. App. 2301).

DIVISION OF LABOR BETWEEN FEMA AND DOD

Senator WARNER. General Stilwell, what is the nature of the division of labor and responsibilities between the Federal Emergency Management Agency's personnel charged with civil defense planning and the Directorate for Emergency Planning in your office and in the Office of the Secretary of Defense?

General STILWELL. The most basic division is the one specified in Executive Order 12148 and in the 1982 National Security Decision Directive on civil defense. FEMA develops, funds, and manages the program while the Department of Defense provides advice and assistance in those areas of program development relevant to its oversight charter.

Because both documents explicitly link civil defense with the Defense Department's nuclear attack planning, principal Departmental responsibility for civil defense oversight within the Office of the Secretary of Defense resides with the Under Secretary of Defense for Policy. Within the Under Secretary's staff organization, the Director for Emergency Planning is responsible for day to day working level contacts with FEMA. This Directorate serves as focal point for all Departmental interaction with the Federal Emergency Management Agency, and is the principal agency through which substantive consultations between civil defense staff elements of FEMA and other staff elements within the Office of the Secretary of Defense take place.

This arrangement gives FEMA access to advisory expertise within the Directorates of the Under Secretary for Policy, and the Under Secretary for Research and Engineering, as well as within the Organization of the Joint Chiefs of Staff. At the same time, it insures coordination of FEMA's civil defense efforts with related nuclear attack preparedness initiatives within the purview of the Department of Defense.

IDENTIFICATION OF KEYWORKERS

Senator WARNER. The budget request contains an $8.2 million funding item for key worker identification in support of the industrial protection program. Would you describe the methodology currently envisioned for providing the necessary identification of such workers? Are other tools available such as census data, et cetera?

Mr. GIUFFRIDA. The $8.2 million budget request you mentioned is actually for the entire Protection of Industrial Capability (PIC) program, of which the identification of keyworkers is a portion. The $8.2 million is broken down into $1.1 million for the Industrial Capability Protection Planning portion of the PIC program which will allow regional industrial planners to work with appropriate representatives of business and industry as they develop plans for protection of

plant capabilities; and $7.1 million for the Keyworker Blast Protection portion of the PIC program.

The $7.1 million Keyworker Blast Protection portion includes funds for: (a) support of efforts leading to the identification of keyworkers; (b) the construction of additional prototype blast shelters; and (c) further testing of blast shelter designs and studies related to enhanced blast shelter protection effectiveness. As to the identification of keyworkers, the fiscal year 1984 budget request includes $3.2 million to support the application of previously developed analytical (criterion-based) methodologies for the identification of essential industries, their associated keyworkers, as well as their numbers and locations. This will include industrial site visits by regional and State personnel. The analytical tools and techniques developed during fiscal year 1983 will have been based on the use of multiple sources of applicable data bases such as census data, labor statistics and pertinent data from the Department of Defense.

DEMONSTRATED CIVIL DEFENSE MOBILIZATION IN DOD EXERCISES

Senator WARNER. General Stilwell, please describe for the committee the experience gained from and the lessons learned in the course of recent DOD command post exercises, such as Ivy League and Proud Saber, in which civil defense readiness plans were played.

General STILWELL. Command post exercises such as Ivy League and Proud Saber are designed to test procedures and mechanisms established to facilitate the transition from peace to war. To the extent that many of these procedures focus upon emergency national mobilization, and our ability to cope effectively with international crises, the scenarios developed to exercise them address civil sector as well as military sector plans and preparations in a variety of hypothesized contexts, including, on occasion, imminent nuclear attacks on the United States.

Exercises such as these are simulations. They do not involve actual movements of forces and personnel. They are designed to create hypothetical situations in which senior officials have an opportunity to assess and evaluate the logical consequences of alternative courses of action. In this context, the principal civil defense lessons learned from Ivy League and Proud Saber concerned the value of having in place well before the onset of a crisis a credible capability for executing well-developed civil defense nuclear attack preparedness measures, and the value of close coordination between senior national officials responsible for civil and military defense measures throughout the course of a crisis.

WARFIGHTING/DEFENSE GUIDANCE

Senator WARNER. General Stilwell, how does the President's plan for an expanded crisis relocation program fit into previous defense guidance concerning preparedness for a protracted nuclear war and the need for an ability for the United States to prevail in such a war?

With the apparent moderation of that guidance issued in the latest directive, has the role of civil defense been modified as well?

General STILWELL. The National Security Decision Directive that governs the thrust of the civil defense program was issued early in 1982, and remains in effect as written. Unfortunately, some of the words and phrases contained in the 1982 edition of the Defense Guidance—a document published annually by the Defense Department to provide budget preparation guidance for the military services—were misconstrued when publicized out of context. The result was widespread public misinterpretation of Defense policy. The requirement that the Department of Defense acquire and maintain a capability for coping effectively with a war that is visited upon the United States, whatever the form of that war may be, remains unchanged. Policy guidance documents have been reworded, however, to reduce the possibility that this requirement again be misinterpreted. The 1983 edition of the Defense Guidance reflects these semantic changes, and remains fully consistent with the President's guidance, as the following unclassified extract indicates:

"Our civil defense posture must complement primary U.S. reliance on strategic offensive nuclear forces as the preponderant factor in maintaining deterrence. The long term objectives of the civil defense program are to provide for the survival of a substantial portion of the population, and to provide for the protection of key defense and population-supporting industries, and the workers in those industries.

"Within DOD, civil defense planning must include measures for protection or dispersal of U.S.-based forces and other associated personnel. Civil defense planning must also include measures to insure the protection and continued functioning of DOD facilities essential for the prosecution of the war and support of the mobilized and deployed forces."

BALANCE OF PRIORITIES: OFFENSE VERSUS DEFENSE

Senator WARNER. General Stilwell, as you are well aware, the Congress is in the throes of an extremely difficult budget debate. In all likelihood, some reduction in the President's funding request for fiscal year 1984 will be forthcoming. In your view, given that strategic offensive forces have—over the past twenty or more years—been emphasized and given budgetary priority over strategic defensive forces, should reductions be made if they must be in strategic defensive forces, should reductions be made if they must be in strategic offensive forces leaving untouched defensive capabilities?

Alternatively, if the Congress should decide to increase the funding for strategic defensive forces, in the face of severe budgetary constraints, should such increases be made at the expense of investments in strategic offensive capability?

General STILWELL. The question of relative priorities was given careful attention when the President's budget was prepared. The very fact that increased civil defense funding is part of the overall fiscal year 1984 request is evidence that we believe it to be every bit as essential as the other programs that are being proposed. The fact of the matter is that both strategic offensive and strategic defensive improvements have been underfunded in the past.

We believe that civil defense is an integral part of our overall defense posture, and that the comprehensive program offered for the improvement of that posture is funded at a level below which we cannot go without incurring unacceptable risk. We do not believe that it is a matter of saying one constituent element of that program is less important than another. In Defense, we believe that all elements are essential, and that optimum priorities are reflected in the funding levels and program pacings that have been proposed.

QUESTIONS SUBMITTED BY SENATOR SAM NUNN

CIVIL DEFENSE TRAINING AND NATIONAL SERVICE

Senator NUNN. General Giuffrida, in the discussion of National Service programs the suggestion has been made that one option for young people to fulfill a national service commitment might be civil defense disaster relief training.

Has your agency done any studies, or do you know of any studies outside your agency, of the numbers of people with disaster relief training that FEMA would need to deal with a widespread natural disaster or even with the aftermath of a nuclear attack?

What would be the cost of providing a basic level of civil defense disaster relief training (4–8 full days of training) to approximately one million people per year under a national service program?

How many people, and in what skills, would be needed to administer such a program?

Does FEMA currently have any programs to train people in disaster relief? How many people receive such training each year, either through FEMA or through private organizations? How long are these training courses, and how are they administered? What types of subjects are covered in these courses?

General Giuffrida, do you think there is a need in this country to provide more people with civil defense disaster relief training?

General GIUFFRIDA. We have answered the foregoing questions on a combined basis, to permit a more integrated and coherent response, and also to address issues raised during my appearance before the subcommittee on March 23, 1983.

In 1966, a 33-page study on civil defense aspects of a possible universal service program was prepared by the Office of Civil Defense, for the Office of the then-Assistant Secretary of Defense for Manpower. (OCD was the predecessor of the Defense Civil Preparedness Agency, which was in turn one of the predecessors of FEMA.)

The 1966 study noted that civil defense needs alone would not justify a universal service program. However, if some form of national service (NS) were adopted for a variety of reasons, civil defense could make effective use of a total of some 6 million NS personnel, to meet the needs of civil governments for trained personnel to augment existing forces of government during major emergencies, whether domestic in origin (e.g., natural and technological disasters) or attack-caused.

We have not reanalyzed in detail the numbers of trained personnel, and the skills needed, outlined in the 1966 study. However, we can identify a need today for at least 1.5 million radiological monitors and at least 1 million shelter managers. The 1966 study also estimated that 1.3 million personnel should be trained as the equivalent of a medical aidman, plus some 2.8 million to be trained in engineering-related skills such as basic firefighting (to serve as auxiliaries to existing paid and volunteer fire forces), rescue, decontamination, and restoration of utilities and other services (NS personnel would support utility and public works engineering forces in these areas.).

We believe that the skills and numbers of personnel reflected in the 1966 report are still reasonable estimates. Of course, some functions and skill categories would be accorded higher priority than others, for example, the radiological monitors and shelter managers noted above. But all of the categories would contribute significantly to the effectiveness of operations in a major or catastrophic emergency. The underlying point is that if a national service program were ever undertaken, substantial numbers of personnel could be used effectively in civil defense areas, with eventual goals on the order of 6 million, presumably to be reached after the program had been in operation for 5 to 10 years.

The nature and length of the training could vary over a considerable range, with consequent wide variation in estimated costs as well as effectiveness. The approach outlined in the 1966 study assumed that a universal service program would be closely related to military training, and that all personnel would in fact undergo 6 to 8 weeks of basic training. Thereafter, trainees would be given a number of weeks of advanced training in one of three functional skill areas (engineering services, such as firefighting, rescue, and debris clearance; protective services, such as traffic control, shelter management, emergency welfare, and radiological monitoring; and medical services). The cost of such training on active duty would be very high, possibly as much as $3 to $4 billion annually (in 1983 dollars) for 300,000 trainee years (implying an annual intake of some 600,000 personnel, each receiving 6 months of full-time training).

Other approaches would involve far lower costs. For example, national service personnel might receive some type of basic training in an active duty status, but then be given training in civil defense skills in communities throughout the country. Such training could be provided through an expansion of FEMA's current training system, which relies on a central Federal facility for development and pilot testing of training. For end-user courses, every effort would be made to utilize facilities such as State training centers and community college, university, and other existing systems. FEMA's National Emergency Training Center (NETC) has estimated that the cost of providing training to one million national service personnel would approximate $150 million per full week of training.

The minimum level of training that would be worthwhile would be one week per individual, with at least two weeks being desirable. Courses of one week each, suitable for national service (NS) trainees, could be adapted from current courses in the areas of radiological defense and of shelter management. Expansion to two weeks would permit better treatment of basic material such as disaster and attack effects and means of protection, and inclusion of some training in first aid. One- to two-week courses could also be developed to permit NS trainees to augment existing local police, fire, and rescue forces.

Such a low-cost approach might thus involve annual costs of some $300 million, to provide an average of two weeks of training for one million NS trainees. The scope and depth of the training would be far less than under the much more expensive active duty approach outlined in the 1966 study, which would provide for intensive training in such areas as medical aidman or engineering skills. Nevertheless, even a relatively low-cost program could add significantly to the ability of U.S. communities to deal with large-scale disasters of all types, including nuclear attack.

The NETC has estimated that some 1,700 people would be needed to administer a low-cost training program of the type just outlined. These would include some 1,500 instructors and assistants providing training in communities throughout the country, as well as course development and media specialists, and management and administrative personnel.

This training program would represent an expansion of FEMA's current civil defense and disaster training programs. In fiscal year 1982, some 16,000 persons were trained in various radiological defense courses, and about 2,000 in shelter management. Another 8,000 to 10,000 are trained annually in administering Federal Disaster Assistance and related areas. We also provide a Basic Disaster Operations course, further supported by exercises for key local and State officials.

Assuming a substantial number or national service personnel to have been trained in civil defense areas, issues remain of what organization and structure should be developed to make their skills available to local communities in case of disaster. The 1966 study outlined options of varying cost and effectiveness, all based on some type of service following active duty training.

The lowest cost, and least effective, option would be to provide lists of NS trainees to local governments in their areas, relying on the local governments to contact the trainees and incorporate them in local emergency forces and plans. There would be no provision for mandatory training (paid or unpaid), and local follow-up would probably vary from moderate to none, with the result that the number of NS personnel would actually serve in an emergency would be much less than the number who had been trained.

Other options were discussed in the 1966 study, involving various forms of obliged local service after training. The most rigorous, and most expensive, approach would be to require NS personnel to complete a stated service obligation in Active Reserve status (e.g., Army Reserve or National Guard). The NS personnel would be organized into units embodying emergency capabilities tailored to the needs of local governments throughout the country, in case of large-scale or catastrophic disaster. Such units might conduct training for approximately four weekends annually, with personnel receiving drill pay in the same manner as members of current Active Reserve units.

The cost of such units would be high, perhaps on the order of $1.4 billion annually (1983 dollars) per one million NS personnel in units (including the cost of a small full-time cadre for administration and overhead functions). Costs could be reduced by such approaches as providing reduced pay for NS personnel, or seeking to have local governments assume some of the overhead costs; however, effectiveness would be reduced as well.

Considerations of public policy and equity would be important should a program for national service be designed and proposed. The approach proposed with regard to civil defense, as one alternative form of service, would need to be developed in the context of the entire national service program. For example, if some of the NS trainees were required to serve for a term of years in military combat or combat-support reserve units, involving 48 paid drills annually plus two weeks of active duty, it might be seen as inequitable to allow those who elected civil defense training to serve on a much more loosely-structured basis, with no practically enforceable obligation for follow-on training or for affiliation with a local government.

Should a national service program be designed, it would be desirable to study in detail European approaches and experience. In the mid-1960's, Denmark, Sweden, and Switzerland conscripted persons for civil defense as well as military service, and similar approaches exist today, in various European countries.

In conclusion, I believe there is a need in the United States to provide more people with civil defense and disaster relief training. Should a system for national service ever be adopted, a substantial number of personnel could profitably be used for civil defense, improving the capabilities of U.S. communities to deal with major emergencies of all types. The options available for training and organizing NS personnel for civil defense cover a broad spectrum of both cost and effectiveness, and any approach adopted in the civil defense area would need to be consistent with other forms of alternative service provided for in the national program.

EXPECTED UNITED STATES SURVIVAL NOW AND WITH IMPROVED CIVIL DEFENSE

Senator NUNN. General Giuffrida, today, under a Soviet attack such as that postulated in the SIOP/RISOP war game, what does FEMA estimate the level of

destruction in the United States to be in terms of economic and industrial base and population casualties, both immediate and after 180 days? Also given implementation of the administration's 5-year civil defense program and the projected Soviet strategic buildup over the same time, what changes in these destruction levels would you project for 1990?

General GIUFFRIDA. FEMA has estimates of expected survival based on studies of assumed large-scale, mid-1980's attacks on urban/industrial as well as military objectives. These estimates are unclassified, whereas results of SIOP/RISOP simulations would be classified.

These studies suggest that given current civil defense capabilities, expected survival would be on the order of 40 percent of the U.S. population, should a large-scale attack follow about a week of crisis. About one-third of the survivors would be injured or suffering radiation sickness, but would be expected to recover, assuming that medical care was not available.

Survival is estimated as of 60 days after the attack, and thus the approximately 60 percent estimated fatalities would include persons who had been immediate survivors, but who succumbed days or several weeks later to fatal injuries or radiation exposure, again assuming that medical care was not available.

FEMA does not have studies of estimated survival as of 180 days after an attack. At 6 months or longer following an attack, total survival could be affected by such factors as the effectiveness of operations to move surplus food stocks to areas (e.g., the northeastern U.S.) which import substantial percentages of the food they consume from other parts of the country. Analyses have generally indicated that such intermediate and longer-term effects would present problems, but that with proper planning, the overall effect on numbers of U.S. survivors would be relatively small compared with the short-term effects of an attack (blast, heat, and fallout radiation). However, the Federal Government has not devoted substantial effort to resources management since the mid/latter–1960's, when plans were developed by the States for emergency management of resources.

If the administration's recommended multi-year civil defense program were fully deployed, expected U.S. survival would be substantially increased. For example, analyses suggest that for the large-scale, mid-1980's attack noted above, total expected survival could be approximately doubled from the currently estimated 40 percent, provided that during a preattack crisis period the bulk of the population in areas later attacked had been evacuated to surrounding low-hazard areas, additional fallout protection had been developed in low-hazard areas, and other actions had been taken to improve civil defense capabilities. About one in eight of the survivors would be injured or suffering radiation sickness, thus improving prospects for eventual recovery.

Such protective capabilities would be provided by the administration's recommended program. The program would also provide for some effort in the area of planning for management of such resources as food, as by updating the State postattack emergency resource management plans which were developed during the mid–1960's with financial support from the Federal Government. This planning would be expected to result in improved capabilities to deal with intermediate and longer-term problems in areas such as food.

FEMA has not made analyses of expected survival assuming a Soviet strategic buildup continued through 1990, and these analyses would require substantial effort and time. We are not persuaded that the value of such additional analyses would be commensurate with the effort required. This is because, as noted in the response to an earlier question by Senator Warner, we believe the importance of such studies is in indicating relative rather than absolute results. Survival in an actual attack could be either more or less than the results indicated by a given study, depending on such factors as the nature of the attack assumed and the level of protection available to the population.

We believe that studies and analyses already completed make it clear that reasonable civil defense preparations have potential to save millions of lives across a spectrum of possible attacks. Such preparations also improve our ability to save lives across the spectrum of domestic disaster which so frequently occur, including natural disasters and those involving hazardous materials.

FEMA has estimates of the level of destruction to the U.S. economic and industrial base that would be caused by large-scale attacks on both urban/industrial and military objectives. For the mid–1980's attack noted above, approximately one-third of our manufacturing capability (measured in terms of

manufacturing value added) would survive if industry had not taken precautionary measures to protect its capability.

We believe that industry can take countermeasures to protect its workers and manufacturing capabilities, thereby assuring that a greater fraction of our national industrial base would not be destroyed by the effects of a possible nuclear attack.

Our Protection of Industrial Capability (PIC) program is currently in a formulation, analysis, and preparation phase, and is conducting the analyses and completing preparations to allow an administration funding decision on an industrial protection program to protect key defense and population evacuation support industries and their essential workers. The results of these analyses will include estimates of the changes in the destruction levels that would result from a Protection of Industrial Capability program. This is in accordance with a November 1981 report by conferees of the House and Senate committees on Armed Services which recommend that ". . . efforts to upgrade the defense program should include . . . developing the means for protecting key industries and related workforces."

Senator WARNER. At this time, General Stilwell, we will take a short recess and then proceed to reconvene in open session and then go into executive session with the next panel of witnesses.

[Whereupon, at 9:25 a.m. the subcommittee took a short recess and then proceeded to other business.]

OPEN SESSION

The subcommittee reconvened in open session pursuant to a short recess at 9:37 a.m. in room 222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Present: Senators Warner, Quayle, Nunn, and Levin.

Staff present: Frank J. Gaffney, professional staff member; Willis D. Smith, deputy staff director and chief scientist for the minority; George K. Johnson, Jr., David S. Lyles, Patrick L. Renehan, professional staff members; Karen A. Love, staff assistant.

Also present: John Campbell, assistant to Senator Warner; Hank Steenstra, assistant to Senator Quayle; Greg Pallas, assistant to Senator Exon; Peter Lennon, assistant to Senator Levin.

OPENING STATEMENT BY SENATOR JOHN W. WARNER, CHAIRMAN

Senator WARNER. The committee reconvenes in open session to expand the scope of our review of America's strategic defense requirements and capabilities.

In our first session this morning, we have examined the contribution that can be made to the defense of the United States by the administration's proposed program for population protection. A witness from the Federal Emergency Management Agency, Mr. Bernie Maguire, recently confirmed as Assistant Director for National Preparedness Programs, will remain so as to address in this broader context further questions that may arise concerning the administration's civil defense plans and programs.

Mr. Maguire will be joined by Mr. John Gardner, Director of Defensive Systems, Office of the Under Secretary of Defense (Research and Engineering). Mr. Gardner will be asked to furnish an overview of the initiatives currently programed for enhancing America's strategic defense capabilities. His testimony will be complemented by that of Maj. Gen. Grayson Tate, program manager for the ballistic missile

defense program; Maj. Gen. Donald Lamberson, assistant for directed energy weapons; and Maj. Gen. Bruce Brown, Vice Commander in Chief of the North American Aerospace Defense Command.

Gentlemen, you are most welcome and we look forward to what I am sure will be a most interesting hearing. We shall begin in open session in order to provide a public record of this highly important subject and we shall then proceed, as may be necessary, into closed session.

Mr. Gardner, you may proceed as you see fit.

STATEMENT OF JOHN L. GARDNER, DIRECTOR, DEFENSIVE SYSTEMS (OUSDRE)

Mr. GARDNER. Thank you, Mr. Chairman.

It is a pleasure and a privilege to be here this morning testifying in front of this subcommittee. What I have is a prepared oral statement for you, giving an overview of our approach to strategic defense.

I have also with me members of both the Army and the Air Force that are here to support me in discussing this program in more detail.

Senator WARNER. We will hold a brief open session, and then we will go into closed session.

Mr. GARDNER. Yes, sir.

Senator WARNER. I will try to do as much as I can in open session so the public can be better informed about these matters.

Mr. GARDNER. We have prepared open material, Mr. Chairman, and will go through that now.

STRATEGIC DEFENSE

What I am going to do is to give you an overview of our strategic defense program, concentrating on the various components of it; initially describing to you what the Soviet Union is doing in this area, followed by the United States program, covering both our warning systems, air defense, space defense, and our ballistic missile defense program.

AFTER THE ABM TREATY OF 1972, WHY ARE WE STILL DISCUSSING BMD SYSTEMS AND STRATEGIC DEFENSE?

When the ABM Treaty was signed, limitations in offense forces were expected to resolve the survivability issue of our ICBM forces.

Instead, as is well-known, a major build-up of Soviet strategic forces has occurred, significantly more lethal than before.

This build-up has included defensive as well as offensive forces, indicating a strategic doctrine significantly different from mutual assured destruction.

These defensive forces include systems that are designed to be effective against bombers and cruise missiles as well as a BMD system.

First, in order to start this discussion, it is appropriate to look backward in time somewhat, particularly the time of the signing of the ABM Treaty of 1972. At that time we were looking for an approach to arms control that would resolve the survivability issue of our ICBM forces.

We expected to be able to limit forces as a result of that treaty and it was a component of that treaty that the strategic forces be limited to reduce the threat to our ICBM forces.

U.S.S.R. STRATEGIC FORCES BUILDUP

Instead, as you well know, there has been a major buildup of U.S.S.R. strategic forces that has become significantly more lethal than before. Not only has that buildup occurred in offensive forces but also there has been a major buildup in Soviet defensive forces as well, indicating that the Soviet view of strategic warfare—as General Stilwell has outlined for you just recently—is considerably different from our own view.

It is clear that the Soviet Union does not adhere to nor support a mutual assured destruction philosophy of strategic forces.

Senator WARNER. I have seen these charts before and the first question arises, perhaps in the minds of some individuals who have somewhat less familiarity with this complex subject than those of us who spend a lot of time on it, when the treaty was signed the limitations in defensive forces were expected to resolve the survivability issue of our ICBM.

Instead, as is well known, a major buildup in Soviet strategic forces has occurred. But that buildup was within the framework of SALT I. They had a license to do it. We left it there on the table.

So, why do you infer that something happened that we did not anticipate perhaps? It was not illegal in the context of international agreements.

Mr. GARDNER. Mr. Chairman, of course the ABM Treaty, the SALT I Treaty, was a treaty that was a limitation on defensive forces only.

Senator WARNER. Yes.

Mr. GARDNER. Now, at the time we signed that treaty, we specified as a condition or as an ingredient to the signing of that treaty that there would be a follow-on limitation in offensive forces that would occur after that treaty, and that that limitation in offensive forces would resolve the survivability problems to our ICBM's.

Now, as you well know, no such limiting treaty on the Soviet offensive forces has been possible to be negotiated.

Senator WARNER. What you are talking about then is the successive efforts in Vladivostok of President Carter and others which did not come to fruition.

Mr. GARDNER. Have not come to fruition, Mr. Chairman.

WHAT HAS THE SOVIET UNION DONE ABOUT STRATEGIC DEFENSE?

They have defenses deployed now, with major improvements underway:
A BMD system deployed at Moscow, now being updated and capable of rapid deployment extensively.
Major upgrades to an already extensive air defense; another deployment now underway is estimated to cost $30–50 billion.
Extensive use of passive defense techniques (hardening, deception, mobility).
A tactical missile defense system is ready for deployment, having potential BMD capability.
The U.S. has no comparable strategic defenses.

BALLISTIC MISSILE DEFENSE

The Soviet Union, just to reiterate this point, has made major improvements in their strategic defenses during this time period. Of

course, they have deployed a defense system at Moscow and that defense system is being improved in major ways.

They have an extensive upgrade to their air defense forces underway. That deployment which is now underway is expected to cost billions and billions of dollars. The estimate to completion ranges between $30 and $50 billion. They have also of course made extensive use of passive techniques, hardening, deception, mobility; and they have a research and development underway on a tactical defense system against missiles.

There is concern that this system would have an inherent potential for ballistic missile defense. The United States, of course, has no comparable strategic defense program to this.

WHY SHOULD OUR LACK OF STRATEGIC DEFENSES BE OF CONCERN?

BMD technology has advanced to the point where systems are technically workable: not perfect, but good.

The Soviet Union now has the capability also.

With limits or reductions in strategic weapons, defenses against these weapons can be more influential.

We will be at a major military disadvantage if the Soviet Union deploys additional strategic defenses and we are not able to do so.

Could introduce questions about the effectiveness of the U.S. retaliation.

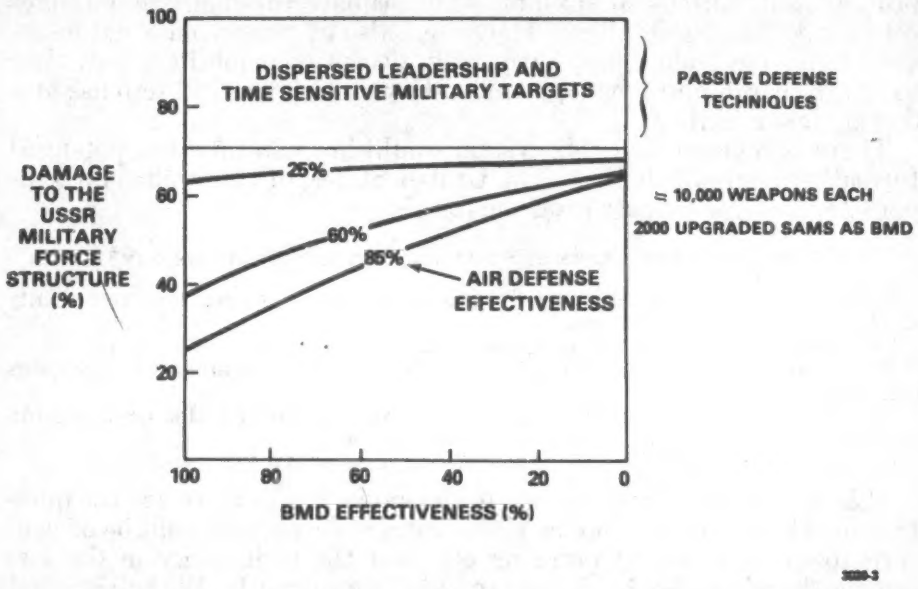
It is appropriate at this stage in the game, I believe, to ask the question of whether or not our lack of strategic defenses should be of concern to us. It is worth pointing out that the technology in the last decade, decade-and-a-half, has expanded significantly. We believe that the situation has occurred where ballistic missile defenses can be built that are workable. They are not perfect—and we would have to go into closed session in order for us to discuss how perfect—but they can be made effective and capable.

We believe that the Soviet Union has this capability also at this time, even though it is somewhat questionable whether they had this capability at the time of the signing of the ABM Treaty 10 years ago.

It is also important to note that as strategic forces become more limited or if we are able to make reductions in strategic forces, we will find ourselves in a situation where the consequences of defenses are more significant than they are now. As the forces become more limited, the significance and military importance of defense becomes greater.

Of course, we could find ourselves in a situation where, if the Soviet Union deployed strategic defensive forces in numbers and with capability, we could be in a situation where our military retaliatory capability could be brought into question.

WHAT IS THE PAYOFF TO THE SOVIET UNION FOR STRATEGIC DEFENSES?



Some understanding of how the Soviet Union might look at strategic defenses is shown here. This is an attempt on our part to understand the sensitivity of strategic defenses to the Soviet Union from their viewpoint. We have attempted to generate this information on a broad, parametric basis so that the major trends could be described and understood.

What I have shown here is the relationship between the damage that we are able to accord to the Soviet military forces as it is influenced by the quality of their air defense system and the quality of a ballistic missile defense system.

It also gives you some feeling about the consequences of the use of passive techniques to defend these military forces.

As you can see, there is relatively a significant payoff for the combination of air defenses and ballistic missile defenses, if combined. On the other hand you can also notice that if the Soviet Union does not deploy a ballistic missile defense, a significant fraction of their offensive forces are still at risk even after they have made this massive investment in air defense that they are in the process of making now.

It leads one to question whether or not you could not expect, based on this kind of information, a ballistic missile defense deployment to follow that massive investment in air defense.

I would like now to turn to the U.S. approach to and objectives for our strategic defense program.

Current U.S. Objective for Strategic Defense

Deter use of Soviet strategic forces.
Provide warning of Soviet attack.

Provide an option to defend our forces from ICBM/SLBM's, bomber, and cruise missile attack.
Deny Soviet post-attack reconnaissance.
Provide surviving forces capable of destroying Soviet targets.

First, of course, our ultimate objective, the No. 1 priority, is to deter the use of the Soviet strategic forces.

We also want to be able to provide warning of such an attack by those forces and to provide an option—an option at this stage—to defend our forces from their attacking strategic forces, be it missiles, bombers, or cruise missiles. We, of course, hope to be able to deny the Soviets postattack reconnaissance for followup strikes on those targets that they would not have been able to destroy in the first laydown.

Finally, it is our overall objective to provide sufficient surviving forces to be capable of destroying Soviet targets sufficient to deter the attack in the first place, which completes the cycle.

WARNING IMPROVEMENTS

Upgrade space-based warning systems (performance and survivability).
Upgrade BMEW's (performance).
Upgrade Pave Paws (additional sites and performance).
Deploying OTH–B for long range low altitude warning against bombers.
Random AWACS patrols.

In order to obtain those objectives and to satisfy those objectives we have a number of improvements under way. We have improvements in our warning systems, both in our space-based warning systems as well as our radar systems deployed both in the United States and in the northern regions of the North American Continent.

We are in the process of deploying an over-the-horizon Back-Scatter radar to both the east and the west coasts to provide us with long-range, low-altitude bomber warning and we are in the process of instituting random AWACS patrols to insure that those forces can be brought to bear and in a more survivable way than would otherwise be the case.

AIR DEFENSE IMPROVEMENTS

Improve performance and survivability.
Deny post-attack bomber reconnaissance and strikes.
Additional AWACS, random AWACS patrols, DEW line upgrades, and additional F–15's.

We have improvements ongoing in air defense as well. Our overall objective of course is to improve both the performance and the survivability of those forces.

We are attempting to deny postattack bomber reconnaissance in that followup manner that I described, and in order to do that we are buying additional AWACS, instituting patrols of those AWACS as well as upgrading the DEW line in the northern portions of Canada and procuring additional F–15's, I think, with which you are familiar.

U.S. SPACE DEFENSE SYSTEM

Deny post-attack reconnaissance of our military forces.
Miniature vehicle interceptor and planned deployment.

We have a research and development program underway for an antisatellite system. That system is configured to be deployed onboard our F–15 fighters, to be capable of making intercepts against low-

altitude reconnaissance satellites from the Soviets and thereby deny them the postattack reconnaissance that would occur from space-based means while we are using our air defense system to provide a similar reconnaissance by air-based means.

The system is in research and development. It takes advantage of modern, high-technology components in order to make the system small and compact, and easily transportable by the F–15. It is now planned for deployment in the latter part of this decade.

APPROACH TO PROVIDE STRATEGIC DEFENSE OF THE U.S. ICBM AND MILITARY TARGET STRUCTURE

A combination of active defense and passive techniques looks promising: Disperse some elements and use combination of hardness, deception, and active defense for the rest.

Produce such major targeting uncertainties that the cost to attack is prohibitive.

The approach to providing strategic defense of both our ICBM's and our military target structure is one that we have been looking at in some detail in recent months. We believe that it is possible to improve the defense of these forces and we are doing studies and research and development work to provide options for doing it.

We believe that the proper approach to it requires a combination of both active defense and passive techniques in order to get the most effectiveness out of our systems and to accomplish the objective of least cost. It would require us to disperse some elements and to use a combination of hardness, deception, and active defense for the rest.

Our approach of course would enable us to provide such major targeting uncertainties for the Soviet Union that they would be deterred from attacking these targets even with the relatively massive buildup that they have underway in their strategic forces.

BMD EFFECTIVENESS FOR ICBM'S

Minuteman can be defended; thousands of defensive missiles required.

Combination of hardness, deception, active defense effective for peacekeeper;

	Very hard (CSB-like)	Moderately hard	Soft
ICBM silos	200	500	5,000
Defensive missiles	100	300	500

100 Defensive missiles, allowed by the ABM treaty, is sufficient.

An example of what we believe might be possible is shown here, considering the defense of our ICBM forces. It is of course capable, we are capable, of building defenses for our Minuteman missiles. The difficulty of course is that the defenses of those fixed, emplaced, relatively soft missiles would require thousands of defensive missiles for their survival. It is technically possible, it would be expensive.

We believe that a combination of hardness, deception, and active defense could considerably improve and provide for adequate survivability of our Peacekeeper if we were to employ these combined techniques.

What I have shown you here is a sensitivity of the relationship between the number of silos that our missiles are deployed in, the hardness of those silos, and the number of defensive missiles required in their defense. As you can see, ranging from relatively soft silos that consist of something like the MPS system for Peacekeeper that was looked at several years ago, ranging to the very hard silos that appear to be now technically feasible based on the work the Air Force has done.

It looks like you can get adequate survivability with relatively small numbers of very hardened silos, combined with relatively small numbers of ballistic missile defense interceptors. In fact, it would appear that it might be possible to get an adequate defense within the confines of the ABM Treaty quantities, as I described.

WHAT BMD PROGRAM IS BEING IMPLEMENTED?

A program for a defense of ICBM's is continuing: improved radar/data processing and option for deployment with existing interceptors.

Advanced system concepts are also being undertaken: an airborne optics search and tracking adjunct, nonnuclear defense systems, and advanced technology on directed-energy systems.

We have underway a BMD program that is being implemented to be able to provide us with a broader array of options. We have an ongoing program to provide for the defense of our ICBM forces in a manner similar to that described to you previously.

That program includes work on improving our radar and data processing capability and we are preserving an option for deployment of such a treaty-limited ABM system, using existing interceptor inventories that are now stockpiled out of our previous ABM deployment.

We also have advanced system concepts being examined in a vigorous way. We are about to initiate a program on an airborne optics search and tracking adjunct to those radars which we believe will provide a major improvement to our defensive capability and significantly increase the resilience and effectiveness of the defense.

We are making a major investment in nonnuclear systems. In the event that we were to find ourselves having to respond to a Soviet thrust in strategic defense, we believe that it would be very much in our best interest to be able to deploy defense systems that utilized nonnuclear warheads. We are looking at defense systems to operate both outside the atmosphere, in the near reaches of the atmosphere, as well as deeper into the atmosphere that can provide defense using nonnuclear warheads.

We also have an aggressive program on directed energy systems which General Lamberson will describe to you in some considerable detail later in the session.

That concludes my remarks, Mr. Chairman, Members. We can either respond to questions now or we can move to General Brown.

Senator WARNER. We will go through the panel, Mr. Gardner. We will now hear from Mr. Maguire.

Do you have anything while we are in open session here?

STATEMENT OF BERNARD A. MAGUIRE, ASSISTANT DIRECTOR, NATIONAL PREPAREDNESS PROGRAMS, FEDERAL EMERGENCY MANAGEMENT AGENCY

Mr. MAGUIRE. I do have a statement, a relatively brief statement, that will simply reiterate some of the things that Director Giuffrida and General Stilwell spoke to you about.

Senator WARNER. Well, I would not reiterate anything unless you have a special point to make.

Mr. MAGUIRE. No, sir; I am prepared to answer questions.

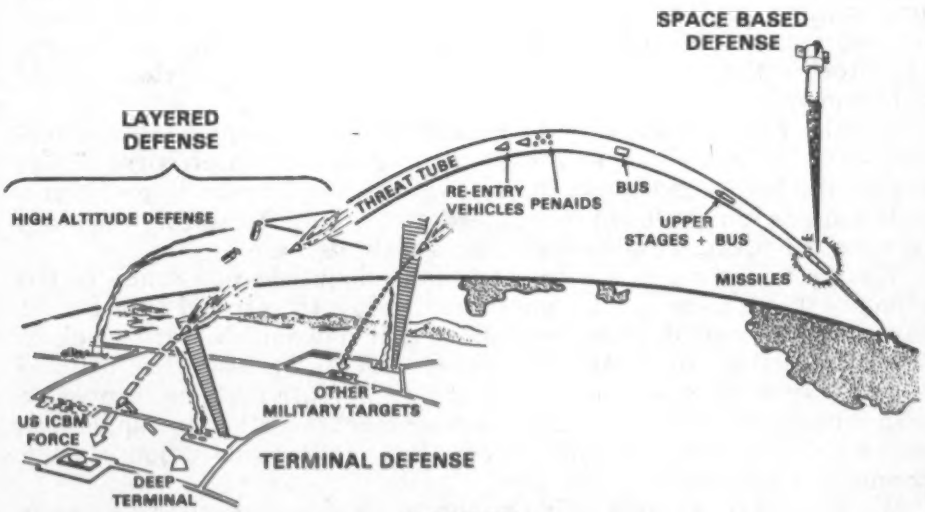
Senator WARNER. We perfectly understand.

Gen. Grayson D. Tate?

STATEMENT OF MAJ. GEN. GRAYSON D. TATE, USA, PROGRAM MANAGER, BALLISTIC MISSILE DEFENSE PROGRAM

General TATE. Mr. Chairman, I have a short unclassified presentation, which will deal with the primary thrust of the ballistic missiles program for which we are asking funds in fiscal year 1984.

BMD POTENTIAL BMD APPLICATIONS



I believe you are familiar with the flight pattern of an ICBM which takes on the order of half an hour or a little more to reach the United States from a launch point in the Soviet Union.

It is useful to look at the various regimes that are involved here because it takes different kinds of weapons and technologies in order to engage ICBM's in the different regimes.

I guess if we had our choice right now we would like to be able to intercept the Soviet missiles during the very early phases of their flight, the first 5 or 6 minutes, while they were still being powered

and prior to the time they kick off all of the warheads and any penetration aids such as balloons or decoys.

Right now, if we could attack the booster or the upper stages, or even the bus vehicle prior to it kicking off its reentry vehicle, we would get a very large leverage by intercepting many warheads at one time.

We are working on weapons which may ultimately have a capability to engage Soviet missiles in this regime. That technology is some years away. As a result, most of the work that we have done over the last 25 years has been down in the lower part of the ICBM trajectory, in fact most of the work, a great majority of it has been in the altitude regime of 100,000 feet or below.

Even in this lower part of the trajectory there is more than one regime. There is one that we call a deep terminal system. This is where you might wait until the very last minute to intercept an either guided or unguided rocket. This would be at an altitude, say of 2,000 or 3,000 feet or less.

Then, the other endoatmospheric system that would operate in the terminal area which could protect either hardened targets such as you see portrayed here or perhaps other military targets, would use system that operate up to altitudes of perhaps 100,000 to 150,000 feet. We have had quite a lot of experience in that area with our Safeguard program and other work that has been going on in the last 20 years.

We also have a high-altitude regime system which operates up to altitudes of perhaps 300,000 feet, still in the atmosphere. We can use various combinations of these defenses in order to have a layered defense system which allows us to employ several different layers of defense. In fact, if we combine that with space-based defense we could eventually provide a very robust defense to look at many, many different types of targets.

BMD Program Objectives

Conduct a vigorous research and development program which will support the President's strategic defense initiatives, contribute to a stable and secure deterrent, and increase Soviet incentives to negotiate genuine arms reductions.

The BMD program will:

Maintain a hedge option for ICBM defense.

Demonstrate systems technology for a full spectrum of defense concepts.

Demonstrate terminal nonnuclear kill capability.

Demonstrate airborne optical adjunct.

Provide an orderly growth path to accommodate advanced threats.

Demonstrate a high altitude nonnuclear system.

Work closely with the Air Force to optimize integrated offense/defense designs.

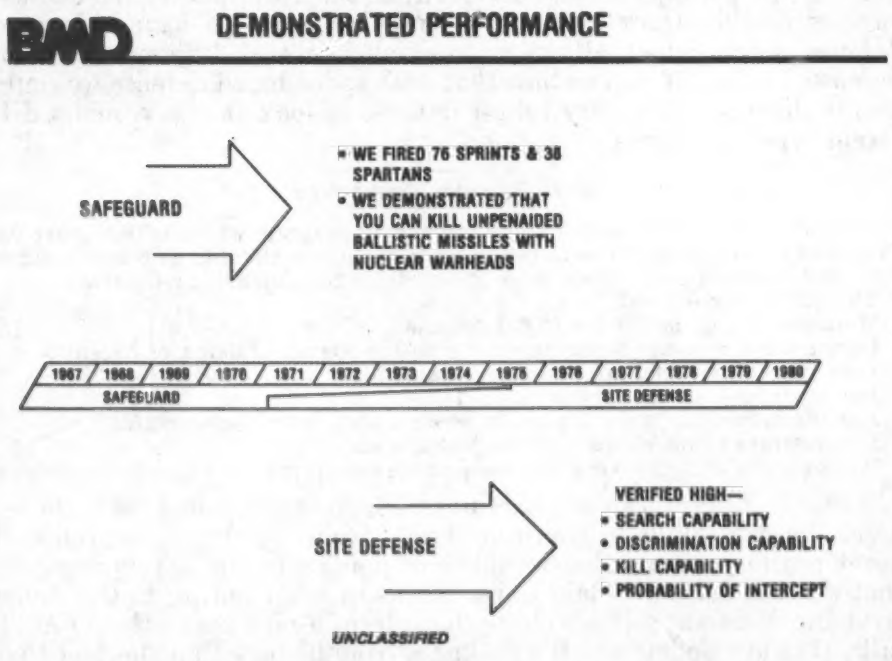
Now, the program that we are pursuing for fiscal year 1984 is shown here. We are going to continue with a very vigorous research and development program that would be responsive to all the requirements that the President has laid down for us in contributing to the stable strategic deterrent and also to perhaps be of assistance in the START talks that are underway. We do know from history that the fact that we had very good technology was one of the primary reasons for the Soviets coming to the negotiating table prior to the signing of the ABM Treaty in 1972.

As Mr. Gardner mentioned, we will maintain a hedge option this year for ICBM defense. That is, there is a specific pot of money that is allowing us to go forward with work that will allow us to have a system in the field in the near term should that be required.

But the primary part of our funding will be to demonstrate systems technology that is looking at a very wide spectrum of threats—such as those that I have discussed on the previous slides—both for hardened ICBM targets and for other military targets as well.

We are going to be working to demonstrate a nonnuclear kill capability for ICBM's in the lower altitude regime, that is 100,000 feet or below. We will use this airborne optical adjunct that Mr. Gardner mentioned and we hope to have it under contract prior to the end of this fiscal year. We are looking at growth paths to counter an advanced threat because even those defense systems that we now look at which appear to give the most survivability for ICBM's against near-term threats, as we move out into the mid and later 1990's, we know that the Soviets can respond to them with more sophisticated threats. It may be against these advance threats that defense will ultimately be the most useful.

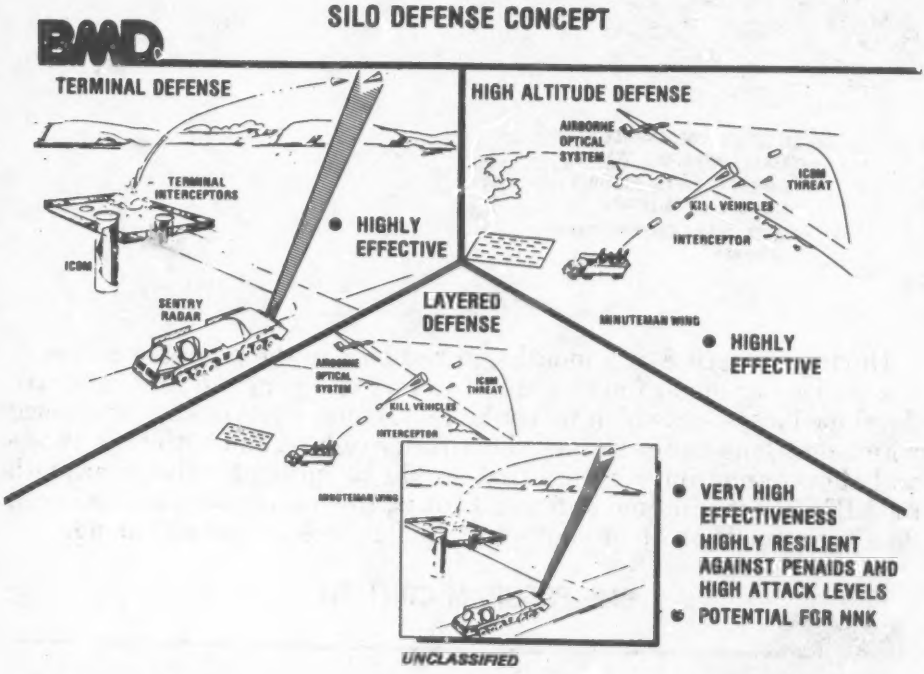
We are looking at a high-altitude nonnuclear capability. Today we can only use a nuclear system. We hope eventually to develop a nonnuclear capability and we have money specifically set aside for that purpose. Of course, we will be working very closely with the Air Force in whatever work they are doing to make certain that we get the maximum synergism from our strategic offensive and defensive forces.


BMD
DEMONSTRATED PERFORMANCE
SAFEGUARD
• WE FIRED 76 SPRINTS & 38 SPARTANS
• WE DEMONSTRATED THAT YOU CAN KILL UNPENAIDED BALLISTIC MISSILES WITH NUCLEAR WARHEADS
1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980
SAFEGUARD
SITE DEFENSE
SITE DEFENSE
VERIFIED HIGH—
• SEARCH CAPABILITY
• DISCRIMINATION CAPABILITY
• KILL CAPABILITY
• PROBABILITY OF INTERCEPT
UNCLASSIFIED

I would just like to remind Members of the committee that we are not just starting paper studies, we have been at this business for quite

a long time now. Even in the Safeguard program from 1967 to 1975 we fired considerably over 100 interceptors. I think we have demonstrated without any doubt at all that with a nuclear armed interceptor, we can get close enough to an incoming reentry vehicle to kill it in a very final way. Those demonstrations were done against targets that did not have penaids—penetration aids. We have had other programs underway since that time, including the site defense program indicated here, in which we have solved a lot of the problems that were with us back at the time of the safeguard system deployment in 1975.

We believe we have a good handle on those. We have verified a very high capability to perform the functions shown on the right side.



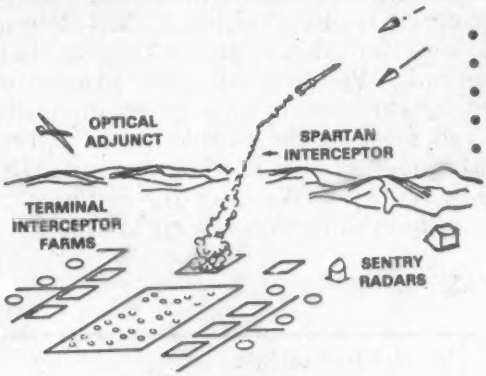
When I briefed the committee last year, a few months after the President's strategic modernization decision, I indicated that we were working hard on a system that would be able to provide defense for MX missiles located in Minuteman silos. This would be done at low altitudes with mobile radars and deceptively based interceptors in order to get maximum leverage from the defense.

We also laid out a program for continuing to work in the high-altitude regime, using optical adjuncts mounted on high-flying airplanes and with mobile systems that would be capable of reaching altitudes of several hundred thousand feet.

When you combine these two systems into a layered defense, of course, you get a rather robust system that has a high effectiveness and the potential for nonnuclear kill.

CSB DEFENSE CONCEPT

BMD



- SENTRY RADAR/DATA PROCESSOR
- TERMINAL INTERCEPTOR
- SPARTAN
- LONG RANGE RADAR
- OPTICS ADJUNCT

- EFFECTIVE PERFORMANCE WITH TREATY COMPATIBLE SYSTEM
- CURRENT PROGRAM PROVIDES EARLY IOC HEDGE OPTION
- MAKES USE OF EXISTING BMD HARDWARE

UNCLASSIFIED

During the past 8 or 9 months, in response to the plans for a closely spaced basing mode for the MX (or Peacekeeper) missiles, we have developed a system which we could deploy in the reasonably near term which uses long-range radars, short-range radars, and both long-range and short-range interceptors that would be quite effective even with an ABM Treaty-limited defense. That is, 100 interceptors or less could do a very good job of protecting an MX in closely spaced basing.

BMD PROGRAM CONTENT

BMD

SUBSYSTEM / MISSION		HIGH ALTITUDE INTERCEPTOR		SENSORS			TERMINAL INTERCEPTOR	
		NUCLEAR	NON NUCLEAR	LONG RANGE RADAR	AIRBORNE OPTICAL ADJUNCT	TERMINAL RADAR	NUCLEAR	NON NUCLEAR
ICBM	CLOSELY SPACED BASING	✓	✓	✓	✓	✓	✓	✓
	MINUTEMAN	✓	✓		✓	✓	✓	✓
OTHER MILITARY TARGETS		✓	✓		✓	✓		✓

DEVELOPED SUBSYSTEM
UNDER DEVELOPMENT
✓ MISSION APPLICABLE

UNCLASSIFIED

The program that we have laid out in fiscal year 1984 I have chosen to portray here, which shows the missions down this side and the subsystems across the top.

For the defense of intercontinental ballistic missiles, either in closely spaced basing or some wider basing such as Minuteman or something in between, we have a very large portion of our program that is devoted to looking at defensive systems for ICBM's.

However, we are not ignoring other military targets.

Across the top I have displayed defense subsystems. The ones that are shown not shaded are the ones in which we have the technology in hand—in fact, even have some components in hand that we could use, such as the Spartan and the Sprint missiles that were developed a number of years ago.

Shown in the shaded portion are those elements that are still under development, that is nonnuclear interceptors both for high-altitude and low-altitude use, and the sensors that must go with those systems to provide information either from optical devices or short-range radars that operate at the present low altitude.

The checkmarks indicate those subsystems that are applicable to these particular missions that I have shown on the left.

SUMMARY

ENDO defense demonstrated—needs engineering development.
EXO nonnuclear defense in experimental phase.
Space based defense in infancy—but offers high potential.

In summary, then, I can say that for the low-altitude endoatmospheric defense we have demonstrated a capability to deploy such a system. It is just at matter of straight engineering if we should be asked to deploy a system that operates at low-altitude regime in the near timeframe.

For the higher altitude we are currently in the experimental phase. The technology is not quite as mature but we believe that systems in the high-altitude regime could be deployed in the reasonably near future.

As for space-based defense, that technology is still somewhat in its infancy but it does offer a tremendously high potential for engaging ICBM's, particularly during the early boost phase when we do get these very high levels.

That is the extent of my remarks, sir, for the open session.

Senator WARNER. Thank you.

General Lamberson?

STATEMENT OF MAJ. GEN. DONALD L. LAMBERSON, USAF, ASSISTANT FOR DIRECTED ENERGY WEAPONS

General LAMBERSON. Mr. Chairman, it is a privilege for me to return to the committee this year and speak to the directed energy programs of the Army, Navy, Air Force, and the DARPA.

I request the acceptance of a formal statement which I have submitted to the committee that expands, in an unclassified form, the application of directed energy to strategic defense. I would like to use the few minutes that have been given to me this morning to merely hit the highlights of that statement.

Senator WARNER. All witnesses will be given the opportunity to insert their full statements.

General LAMBERSON. Thank you, Mr. Chairman.

Directed energy technology consists of these three forms of energy at this point of time.

DIRECTED ENERGY WEAPONS

High-energy lasers.
Particle beams.
High-power microwaves.

A characteristic of directed energy weapons is the ability to deliver energy to a target very, very fast. Lasers and microwave became propagate energy at the speed of light; that is as fast as we can go. Particle beams, the third form of directed energy, travel very close to the speed of light.

So, one characteristic of directed energy weapons is that they deliver destructive energy to the target extremely fast.

A second characteristic which these three forms have in common is an ability to focus energy in a smaller area than one would get with other more conventional weapons. I want to make the point that, particularly with respect to strategic defense—this is all we are addressing this morning of course—that these concepts are very much in a technology stage. I would like to depict that on the next chart, where we are now in the program.

DIRECTED ENERGY TECHNOLOGY
DEVELOPMENT NEEDS VS. MILESTONES

UNCLASSIFIED

NEEDS \ MILESTONES	CONCEPT EXPLORATION	TECHNOLOGY DEMONSTRATION	TECHNOLOGY VALIDATION	FULL SCALE DEVELOPMENT
DEVICES				
BEAM HANDLING				
ATP				
SECONDARY TECH				
PROPAGATION				
EFFECTS				
TARGET V&H				
WEAPON CONTROL				
EFFECTIVENESS				
SURVIVABILITY				
INTEGRATION				
SIZE & WEIGHT				
RELIABILITY				
PRODUCEABILITY				
MAINTAINABILITY				
FIELDABILITY				
AFFORDABILITY				

DECREASING:
- UNCERTAINTY
- COMMONALITY

INFORMED DECISIONS

INCREASING:
- ENGINEERING
- RESOURCES
- PERFORMANCE SPECIFICATION
- FREQUENCY AND DEPTH OF UTILITY ANALYSIS

If we look at milestones that you are used to seeing in research and development programs, you recognize that full-scale development is the step before production. I want to point out that none of the directed energy programs that I will be talking about are in full-scale development. We are walking down a path unfolding the physics and

exploring concepts demonstrating technology, looking at the validation phases as the next step. Our goal is to get informed decisions for ourselves and in turn for you, on the kinds of needs that apply to all kinds of directed energy. Can you make the beam? Can you propagate it? What happens when it gets to the target?

So, we are very much in the early stages of technology demonstration with programs that have been approved by the Congress.

DIRECTED ENERGY AND STRATEGIC DEFENSE

FORM

HIGH ENERGY LASER	PARTICLE BEAMS	HIGH POWER MICROWAVE

BASING

SPACE	AIRBORNE	GROUND/SHIP

TARGET

BALLISTIC MISSILES	STRATEGIC AIRCRAFT	SATELLITES

I would like now specifically to refer to strategic defense. We have talked to the three forms of directed energy. You could base a weapon using any of those forms in space or on aircraft, or on the ground, or on a ship to engage the three targets that are particularly applicable to strategic defense—ballistic missiles, strategic aircraft, or satellites.

You see there is an enormous number of applications that one can address. You can pick one from this row, one from this row, and one from this row—there are 27 combinations that yield directed energy concepts for strategic defense purposes. Now, obviously some of those are better and easier than others.

I would like at this point just to indicate that there are important differences in the vulnerability, and in the potential hardness of the three target type. Satellites are very much more vulnerable than the others. It is much easier to kill a satellite than it is a strategic aircraft, and doing that is much easier than killing a ballistic missile.

Therefore, one application that one might look at—is, indeed, being looked at with some remarkable progress in this past year—is the use of a high energy laser on the ground going against satellites. We would like to expand on that in closed session.

One of the programs, that the Congress has supported and that was reviewed at considerable length the last two years is in this first column. It is the use of a laser from a space platform going against ballistic missiles.

I would like to briefly summarize the program. Why is that attractive? Well, first of all because ballistic missiles are most vulnerable in their boost phase as they are leaving the launch pad. In order to attack

them in that phase they must be attacked from space and, therefore, the use of a laser in space can make that application appear to be attractive. I would like to spend a few moments telling you about the progress in that program.

[Chart deleted.]

This cartoon is just that, to indicate that one has in mind space platforms that have on board lasers and large optical systems which can propagate those beams against various targets. Now, unfortunately, this is a cartoon. We do not know what these systems would look like; we do not know what they would weigh; we do not know what they would cost.

It is the purpose of the program that we have outlined to the Congress to make the determination that could transfer this concept from cartoons into reality.

DOD Space Laser Program Objectives

Concept definition of survivable, cost effective space laser deployments.
Demonstrate technical feasibility of critical elements.
Pursue technology growth for more demanding missions.

Specifically, the DOD Space Laser program plan which was approved and forwarded to Congress by Secretary Weinberger in June of 1982 was funded in part by the Congress a year ago. This program has in mind the arrival of a concept capable of surviving to mission completion. It, most importantly, will demonstrate the technical feasibility of the critical elements of a space laser system, such as the lasing and the optics. As the pursuit of technology grows we may be required to get to more robust ballistic missile systems.

DOD Laser Program

Provide by 1988 the basis for informed development decision.
Oriented to strategic defense missions.
DARPA, Air Force, Army participation.
DARPA provides baseline technology through TRIAD.
Program plan approved by Sec Def, 21 June 1982.

The goal of that program is to provide the Department and the Congress by 1988 the basis for an informed decision on the next step. Should that be a commitment to on-orbit demonstration for a validation program, or a full-scale development program? This is what that decision would lead to beyond 1988. It is oriented to a strategic defense mission and therefore most appropriate to this committee.

It does involve the DARPA as well as Air Force and Army participation, and it does provide the baseline technology through DARPA. This is the program approved by Secretary Weinberger in June 1982.

Uncertainty Resolution

Target vulnerability and hardening utility.
Survivability.
System definition.
Basic technology demonstration (DARPA Triad).
Weapon feasibility technology.
Growth technology.

The cornerstone of the program is the resolution, is the reduction of uncertainties. What is it that we cannot tell you today about going to

space and hitting ballistic missiles that we need to be able to tell you before a decision is made.

The first four elements of this program constitute an Air Force program. Now, we appreciate the support of this committee in getting this program through last year, but it did not survive the authorization process and so there were no fiscal 1983 dollars spent on these top four items.

We are, I am pleased to say, spending forward funded fiscal 1982 dollars which were authorized by the Congress for this purpose last year. We have awarded contracts to look at these four activities—not at the level that we wanted to—but there is work that is on-going to say how hard can we make targets to resist laser radiation? How hard can the Soviets make a booster? Is it easier for them to harden boosters than it is for us to attack them? We do not really have the answer to that question very clearly at this point.

How would one use the command and control? How would one direct a space platform if you had it up there? Can you make it survive? Can it withstand any kind of attack, nuclear or nonnuclear? For that one needs system definition and that is what that Air Force part of the program is to do. We certainly hope that that will be supported by the Congress this year.

What is supported in fiscal 1983 is the basic technology demonstration or the so-called Triad, and I would like now to speak to that project.

The Triad consists of a laser module which would be representative of that which would be necessary to get to a viable space capability

and the necessary optical configurations to go with that: a very large—4 meters in diameter optic that has not been constructed before. The third piece of that Triad is a demonstration of the necessary acquisition, tracking, and pointing capability from a space-borne platform. All three of these are essential ingredients if one is to be able to say that one can put a laser in space for any purpose, but in particular for the purpose of addressing strategic defense against softer targets.

These three programs have proceeded satisfactorily over the past year. They are in design and component demonstration form. With the money that is requested in the 1984 budget, these programs would begin transition from design to the manufacturing phase. This program would lead to demonstration, that would then make the 1988 decision one of an informed nature.

So, what I believe we are proposing is a vigorous program at the technology level to sort out with the funds that are provided, the current uncertainties about space laser capabilities. Then we can make an informed decision as to whether space lasers can be used to improve strategic defense as we understand it in the future.

Thank you very much.

[The prepared statement of Maj. Gen. Donald Lamberson follows:]

PREPARED STATEMENT BY MAJ. GEN. DONALD L. LAMBERSON, ASSISTANT FOR DIRECTED ENERGY WEAPONS TO THE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

THE DOD DIRECTED ENERGY PROGRAM AND ITS RELEVANCE TO STRATEGIC DEFENSE

I. Introduction

The Department of Defense maintains an extensive program that is developing directed energy technology for eventual application to weapon systems. Such weapons may ultimately take many forms and be applied in many specific missions—perhaps as many as missiles and guns. Of these missions, some of the most promising are as part of a defense-in-depth of the United States against strategic attack. The technology is emerging. While the concepts have been discussed for several decades, it is only within the last decade and a half that discoveries have occurred that promise viable weapon systems. There are no deployed directed energy weapons to date and we expect that there will be another decade of development before such weapons enter the operational inventory.

To address the applicability and potential availability of such weapons, this statement will outline the general characteristics and capabilities of directed energy weapons, how this technology relates to America's strategic defense posture, and the goals and progress of our current directed energy technology programs.

II. Characteristics and capabilities of directed energy for strategic defense

What is a directed energy weapon? A directed energy weapon generates radiant energy or energetic particles and focuses it into a narrow beam pointed at targets. This energy may come from chemical fuel, electrical power, intense heat sources or high explosives. These beams consist of charged or neutral atomic particles or electromagnetic radiation and are capable of near-instantaneous delivery or very intense energy densities to targets. Directed energy weapons have a wide array of different possible applications depending on the ability of the beam to propagate through the air, the ionosphere, or space. Thus, one can talk about endoatmospheric applications at ranges of 10 km and about exoatmospheric application at ranges of 10,000 km and still be discussing directed energy weapons. Directed energy weapons may be ground-, sea-, air-, or space-based depending on the size of the weapon, the mission that it must perform, and the ability of the beam to propagate to the target.

The potential contributions of directed energy weapons to deterrence of strategic attack—the primary goal of both strategic offensive and defensive forces

of the U.S.—are significant. They could introduce new vulnerabilities to a potential enemy's arsenal of strategic weapons and therefore introduce new uncertainties in his ability to achieve his objectives in a strategic attack. For example, they could

Deny the use of space for collecting and distributing crisis management and targeting information while protecting our space assets that warn against a surprise attack.

Engage and defeat limited nuclear strikes using ballistic missiles by engaging such missiles in the vulnerable boost phase.

Provide response options that neutralize or disrupt enemy targets in a measured, selective manner without breaking the nuclear threshold.

Selectively thin-out the attacking missiles and aircraft and disrupt any attempt at a disarming first strike.

Aid U.S. strategic force retaliatory strikes by suppressing air defenses.

Continually attrit reserve strategic forces in a nuclear war and deny targeting information essential to the effective use of such forces.

A single directed energy weapon could be designed with the capability of negating tens of targets in a relatively short amount of time. Directed energy weapons might be used as a stand-alone defense, or, more likely, as part of a defense-in-depth concept. For example, a constellation of space laser platforms might by themselves defend U.S. satellites from attack and also might possess the capability to negate, say, 50% of a large-scale ICBM attack on U.S. strategic forces by engaging several hundred missiles in boost phase as the first layer of a ballistic missile defense-in-depth.

III. Development status

While directed energy technologies offer promise of broad application in strategic defense, we have not yet achieved feasible, cost effective weapon systems using these new technologies. The technical maturity of these concepts varies from early in the proof-of-concept phase to approaching the maturity necessary to enter the validation phase of a formal weapon development program. As in most development programs, we are focused on two basic issues—are such weapons feasible, and, if they are, can they be made cost-effective? Our efforts to resolve these issues are extensive. Unlike familiar weapon forms such as guns, we are addressing these issues for the first time. We recognize that defensive applications could be a very attractive and competitive use of directed energy weapons. In strategic defense the payoff could be particularly high. Accordingly, we need and have a prudent and aggressive DoD program to resolve the critical uncertainties associated with these two basic issues.

The first basic issue is that of technical feasibility. A directed energy weapon, in general, would consist of an energy source, a device such as a laser or particle accelerator, optical systems to direct and focus the beam, and ATP to acquire, track, and point at several targets in the span of seconds. Another critical issue involved in technical feasibility is the ability to propagate over the ranges required to be effective. Other issues include, for example, weapons control, damage assessment, surveillance, adequate C^3, the ability to launch and assemble the weapon, and exhaust management. These issues have somewhat lower priority in establishing technical feasibility but must be addressed in advanced technology demonstrations and prototype weapons development.

The other basic issue concerning directed energy weapons development is whether such weapons can be made cost effective. Several different critical issues are being addressed such as weapon lethality, system survivability to mission completion, utility in the face of countermeasures, system conceptual designs, and system cost. Because the technology of directed energy weapons is rather immature in comparison to conventional systems such as missiles, airplanes, and guns, our goals in this area are rather modest. These goals are, basically, to resolve and bound the uncertainties sufficiently to provide the Secretary of Defense with enough information to enable an informed decision to proceed with advanced development, testing, and engineering phases if and when the technology for directed energy weapons is ready.

IV. Development efforts supported by the proposed fiscal year 1984 budget

While most of the DOD directed energy program supports technology developments relevant to the many potential strategic defense concepts, this statement will describe three types of efforts as samples of what the program is doing and plans to do. They are the space-based laser, ground-based laser antisatellite, and particle beam efforts.

The DOD Space Laser Program.—There are some obviously attractive benefits for using laser weapons in space. Outside the atmosphere, the laser beam is not disturbed from the weapon to target. Thus, lasers have the potential to transmit damaging energy at the speed of light over very long distances. Furthermore, lasers are not weapons of mass destruction. They direct energy to a prescribed target area and nowhere else. Basing such weapons wholly or partially in space can take advantage of these attributes to maximize their values as a deterrent to attack at all levels of conflict. In particular, space based lasers may be able to perform all of the specific missions cited in Section II of this statement.

Last year, the Secretary of Defense approved the DOD Space Laser Program Plan, formulated by DARPA, the Air Force, and the Army. This plan deals with resolving, by fiscal year 1988, basic uncertainties that prevent making an informed decision on whether or not to proceed to the validation phase of weapon development. The program defined by the plan has three basic objectives:

Define the concept of a multimission space laser deployment that can survive until its mission is completed and assess cost effectiveness of such deployments.

Demonstrate the technical feasibility of the most critical elements of this conceptual space laser weapon deployment.

Pursue technology paths that could provide a growth in performance to accomplish more demanding missions and overcome a responsive threat.

In the recent past, at the direction of Congress, the DOD has examined the options on program pace spanning the spectrum from a technology only program to a "Manhattan project" type accelerated effort. These studies, for the first time, clearly define the scope of the remaining uncertainties concerning whether an effective weapon system can be achieved and the size of the risk involved in a greatly accelerated program. The resulting DOD Program Plan is an investment of about $900 million dollars over the FY 1982–1988 time period designed to vigorously address the most critical issues to be resolved in order to reduce the risk to a prudent level prior to proceeding to expensive on-orbit demonstrations.

Approximately two-thirds of the space laser funding is going to resolve issues of basic technical feasibility of performing the primary functions of an effective laser weapon. Most of this effort goes into the three programs which constitute the DARPA Space Laser TRIAD: ALPHA, LODE, and TALON GOLD. ALPHA is examining the feasibility of generating high laser power in a space compatible configuration at mid-infrared wavelengths. LODE examines whether it is feasible to provide beam control at high brightness levels and addresses whether it is feasible to produce very large primary mirrors for the beam director that are figured to very stringent tolerances. TALON GOLD is examining issues of whether it is feasible to stabilize, with extraordinary precision, a beam spot on a dynamic target from space. Most of the technology being examined in LODE and TALON GOLD, while addressing mid-IR wavelengths, have substantial legacy in short (submicron) wavelength lasers. TRIAD is planned to demonstrate the technology that can be scaled to levels appropriate for strategic defense applications. Currently, the TRIAD programs have successfully passed preliminary design reviews and demonstrated limited brassboard scaling. At this time they are on schedule to support the 1988 decision milestones.

The Air Force part of the space laser program is concentrating on target vulnerability and hardening, system concepts, utility, and survivability of a multimission (counterspace, counterair and limited BMD) force. All of these efforts require a preliminary system definition. The uncertainties in these areas are broad and, as a result, opinions on the practicality of space lasers can vary widely. Air Force efforts are designed to insure such opinions are based on fact and not speculation, on data and not on instinct. Since the fiscal year 1983 funds for these efforts were denied by Congress, we have been forced to postpone the milestone for a decision on initiation of validation from 1987 to 1988. These efforts are currently underway using fiscal year 1982 funds. We hope to meet these new milestones if the present efforts are funded to the level of the DOD Space Laser Plan.

The Army space laser efforts are, of course, focused on ballistic missile defense. It is a modest program that takes advantage of the DARPA and Air Force efforts and supplements them—principally in short wavelength activities. The most critical uncertainty in cost effectiveness of BMD concepts appears to be the extent to which ballistic missiles can be hardened to laser radiation. Without an answer to this question, cost effectiveness in BMD missions cannot be reliably ascertained.

Another critical area of research that complements the mid-IR efforts of the TRIAD is short (sub-micron) wavelength technology. The content and pace of these efforts are based on the fact that these technologies are about one decade less mature than present mid-infrared laser technology. We are pursuing research and exploratory development efforts aimed at determining whether we can scale the technology to performance levels needed for the advanced weapons concepts associated with this technology. Assuming that one can achieve high power short wavelength laser devices and an order of magnitude improvement in optics and ATP over the TRIAD performance levels, short wavelength laser technology may offer a significant improvement in effectiveness over mid-infrared wavelength lasers of similar dimensions. We are currently pursuing several programs in short wavelength technology which total over $50 million per year, including an additional $10 million appropriated by Congress for fiscal year 1988.

The DOD is conducting research into high power and high beam quality laser devices—in excimer, free electron, and chemical lasers. In addition, we have programs in atmospheric compensation, short wavelength mirror coatings, and ultra-high precision inertial references. Furthermore, the LODE and TALON GOLD programs are providing a substantial legacy that supports short wavelength technology development for weapons systems for strategic defense.

Ground-Based Laser Antisatellite.—In addition to the space laser program, the DOD is pursuing directed energy technology efforts that could support development of a ground-based laser antisatellite weapon. Recent technology developments have been encouraging in this potential application. Accordingly, fiscal year 1984 funds provide for a number of options at several wavelengths which appear promising for antisatellite applications. We hope to examine these options over the next few years.

Particle Beam Technology Program.—Particle beam technology is currently the least mature of the directed energy technology efforts. In the long term, they hold the promise of being excellent strategic defense weapons. Unlike laser radiation, high energy particles can penetrate to the insides of targets and cause great damage through several direct and indirect mechanisms. Thus, for example, re-entry vehicles, which may not be very vulnerable to laser irradiance, could be damaged more easily by an intense beam of high energy particles. We have two types of particle beam weapons under development—charged particle beams and neutral particle beams. Both these efforts are in the proof-of-concept level of technology at the present.

Charged particle beams could be useful for endoatmospheric, point defense applications such as defending high priority targets against bombers, cruise missiles, and terminal re-entry vehicles. The primary emhpasis of our present program is on the 50 MeV electron accelerator at Lawrence Livermore National Laboratory known as the Advanced Test Accelerator (ATA). The Advanced Test Accelerator has been assembled, is currently undergoing initial checkout tests, and has, in several key performance parameters, exceeded design specifications. Key issues being examined relate to the pulse forming network for high-powered, high-repetition rate operation. This involves the storing of energy in a cylindrical three-conductor transmission line, called a Blumlein, which acts very much like a large-scale capacitor and can rapidly deliver large amounts of energy into accelerating millicoulomb level electron pulses to 50 million volts per electron.

With the successful operation of the ATA, we have a charged particle beam facility that can examine issues of target damage effects and atmospheric propagation. An additional use of the ATA will be as a means of assessing the technical feasibility of weapons level accelerators involving very energetic (several hundred MeV and higher) particle beams with high duty factor. Another program currently under consideration is the feasibility and design of an experiment that would use the ATA as the electron source for a free electron laser.

Applications of particle beam technology for space-based weapons for boost phase and mid-course BMD and for counterspace missions are focused on neutral particle beams. The neutral particle beam program is being examined with the Accelerator Test Stand at the Los Alamos National Laboratory. The accelerator permits experiments in the generation of intense atomic beams. If successful, work on a more advanced neutral beam device could be underway later in this decade.

Because of the relative immaturity of the technology, efforts in system effectiveness have generally been confined to lethality studies of materials and

system components. As the technology matures, it will become appropriate to define weapons system concepts and establish cost-effectiveness of these concepts.

V. Summary

To summarize, the DOD believes that directed energy weapons offer promise of making major contributions to the U.S. defense posture. They are brand new weapon forms that have never been developed and deployed before and, therefore, have no history of employment and measurement of effectiveness. DOD plans, over the next decade, to bring the most mature forms of these technologies to decisions on whether or not to initiate weapon development at the validation phase. Our program is dedicated to determining whether directed energy weapons, deployed in concert with other strategic defense systems, can more nearly balance the offense/defense scale which has been dominated by the offense since the introduction of nuclear weapons.

We believe that, in light of the relative immaturity of the technology and within the resources allocated to the program, we have fashioned a series of prudent and aggressive technology risk reduction efforts in several diverse aspects of directed energy technology. These efforts have decentralized execution by the Army, Navy, Air Force, and DARPA. The Office of the Assistant for Directed Energy Weapons has been established to provide centralized oversight and coordination. These efforts are unlikely to have significant impact on our strategic defense in the 1980's but could provide the technology base to develop a strategic defense using directed energy weapons in the 1990's or beyond.

Senator WARNER. Thank you, General Lamberson.
General Brown?

STATEMENT OF MAJ. GEN. BRUCE K. BROWN, USAF, VICE COMMANDER IN CHIEF, NORTH AMERICAN AEROSPACE DEFENSE COMMAND

General BROWN. Thank you, Mr. Chairman. It is a pleasure to appear before the committee and provide an update on what has been going on in Colorado Springs in the strategic defense area since General Hartinger appeared before the committee last year.

PRESIDENT'S STRATEGIC MODERNIZATION PROGRAM

Modernize strategic bombers.
Deploy a new, more accurate submarine launched missile.
Deploy MX missiles.
Improve command, control and communications systems.
Improve strategic defenses.

Two of the five elements of the President's strategic modernization program apply to our mission. First is the improvement to our missile warning system that Mr. Gardner described. I will be concentrating on those elements under strategic defense which include improvements in air surveillance, additional AWACS, and force modernization.

STRATEGIC AIR DEFENSE

You cannot really describe air defense without remembering that we are allied with Canada in the strategic air defense of North America.

U.S.-CANADIAN JOINT AIR DEFENSE POLICY STATEMENT

Tactical warning/attack assessment.
Airspace access.
Damage limiting.

A significant development has come from that alliance. On March 1, 1981 the United States and Canadian Governments announced in Ottawa a new joint air defense policy agreement which listed these three elements as objectives that we want to achieve between the two countries.

We want to provide tactical warning and attack assessment of bomber attack equivalent to that we provide of ballistic missile attack to insure the survivability of our strategic forces.

We want to control access to North American airspace and be able to use the forces developed for that purpose to limit damage if an air attack should take place.

AIR DEFENSE

	Early 1960's	Today
System:		
Interceptors	2,612	317
BOMARC	439	0
ADA batteries	274	0
Long range radars	286	81
DEW range radars	81	31
Picket ships	11	0
Gap filler ships	137	0
Control centers	68	10
EC-121	77	0
AWACS	0	7
Manpower	207,000	37,000

Since the 1960's, we have cut back on air defense generally because of having made an explicit decision not to defend against ballistic missiles. The question was asked why should we worry about defense against bombers when we have decided not to defend against missiles—we are not suggesting that we ought to return to the air defenses of the 1960's, but we are suggesting that we have cut back too much and in so doing created an attractive no warning option for the Soviet planner.

[Chart deleted.]

For years the demise of the Soviet bomber force has been predicted, but, as you know, they are now flight testing their new B–1-like Blackjack. So no matter what our views are, they apparently still see some utility in their bomber force.

Senator WARNER. Now, we are in the open session, of course, but the clear configuration of this aircraft is for intercontinental strategic missions.

General BROWN. No question.

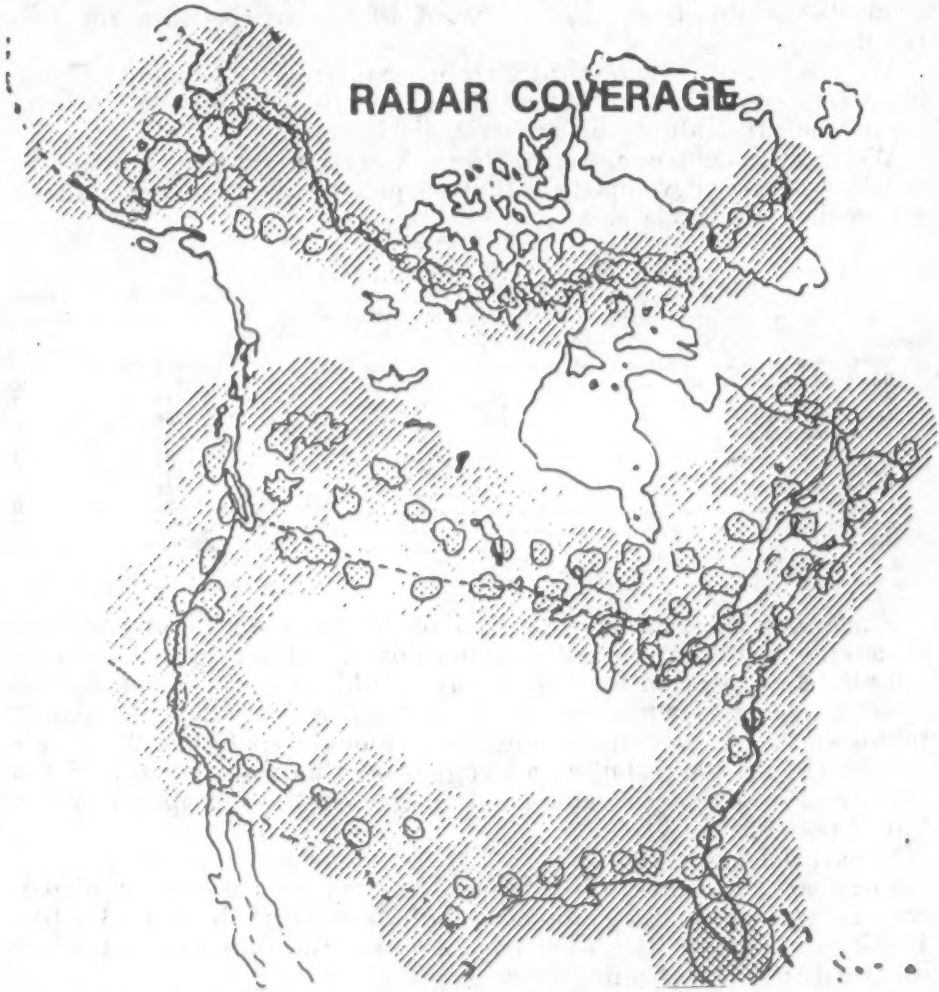
Senator WARNER. That just pushes all the doubts that we may have had—not I—of the Blackjack as to its adaptability to a strategic mission. This is clear.

General BROWN. There is no controversy within my community that I am aware of with respect to that at all.

As you may recall from General Hartinger's presentation last year, he commented that we say we have a strategic Triad but. in fact, what we really have is quadrade. consisting of the three offensive forces plus the fourth leg of the quadrade which is a reliable unambiguous warning that insures the survivability of those forces.

We spend a lot of time worrying about providing that warning against ICBM's and SLBM's. But as I pointed out earlier, in cutting

back on air defenses we may have created an equivalent opportunity for the Soviets with bombers.



The orange on this chart represents the high altitute radar coverage we have today, the red represents the low altitude cover. As you can see, it does not present much of a challenge to the Soviet planner and I do not think any of us in the air defense business question for a moment the ability of the Soviets—if they chose—to avoid radar detection and perhaps conduct no warning bomber strikes against our forces.

Senator WARNER. Well, in a sense, do we have a national line there that can be circumvented?

General BROWN. If it is a national line, Mr. Chairman, it is a very leaky national line.

Senator WARNER. That proves to be somewhat leaky.

General BROWN. Back in the heyday of air defense we had picket ships, Texas towers, and a great number of airborne early warning radar aircraft. All of those things disappeared and today we are left

with only these microwave radars. That is the only warning we have today, the 200-mile range microwave radars that are so widely spaced that there is no question that the Soviets would have no difficulty underflying them.

For my part, I have served on both sides of that fence. I spent a lot of my career in air defense. I also commanded two SAC bomber wings and I assure you if I put my SAC hat on, that is not much of a challenge.

OTH BACKSCATTER RADAR

The first step on the road back is, as Mr. Gardner pointed out, the deployment of the over-the-horizon Backscatter radar which will give us an all-altitude bomber detection capability out to about 2,000 miles. OTH–B will give us the tactical warning that will introduce enough uncertainty into the equation. We think it is important that the Soviet planner will not have the certainty he has today that he get through.

Senator WARNER. Do you run exercises where SAC is trying to penetrate that system?

General BROWN. Yes, sir.

Senator WARNER. And those penetrations are successful?

General BROWN. Well, in order to insure that the crews get sufficient training, SAC flies high enough that they will be detected. There is no point in conducting low altitude exercises.

Senator WARNER. You know how they will come out.

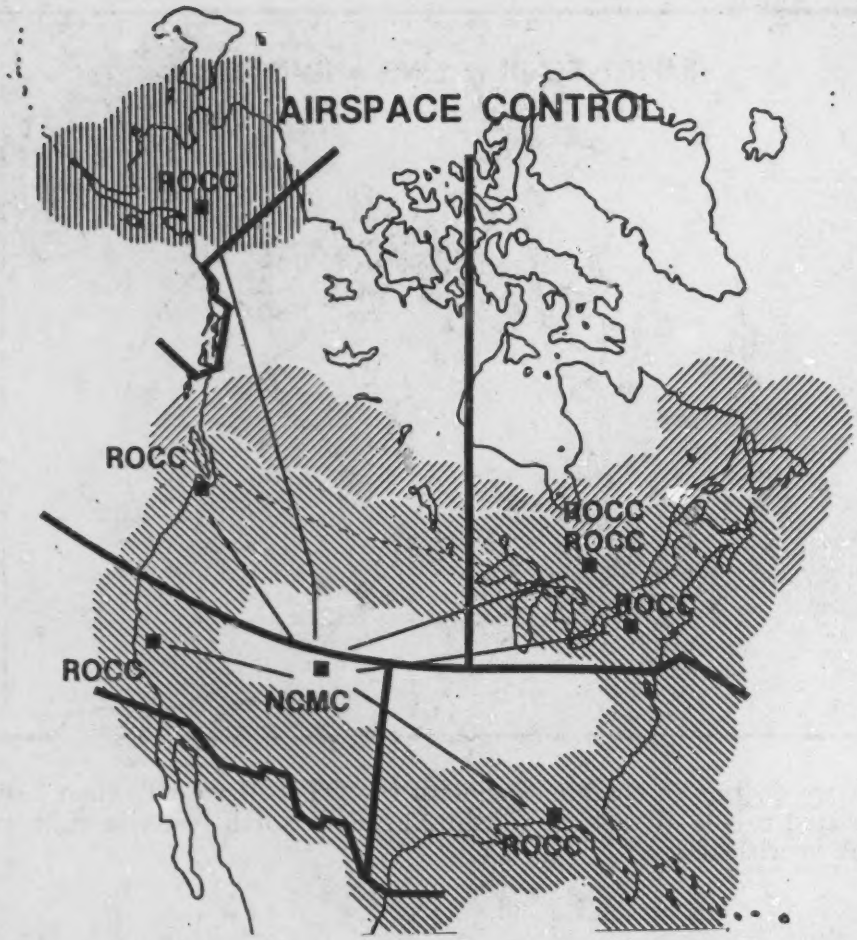
General BROWN. Yes, sir. Now, when we introduce the AWACS we are to conduct low altitude training and low altitude parts of exercises. But there still are not nearly enough AWACS to be able to do that except throughout a small portion of an air defense exercise.

The AWACS, of course, does an excellent job of long-range low-altitude detection. The problem, of course, is you cannot maintain a barrier with the AWACS exclusively because it would be terribly expensive. It would take the gross national product to maintain an AWACS barrier around North America day in and day out.

So, the first step on the way back, as I indicated, is the deployment of the OTH–B. We have in the program now an east coast and a west coast deployment. Ultimately, we may want to deploy one looking south. You notice, that leaves the northern portion open. OTH–B does not work looking to the north because of disturbance caused by the Aurora. We looked at two alternatives, space-based radar and modernizing the current DEW line.

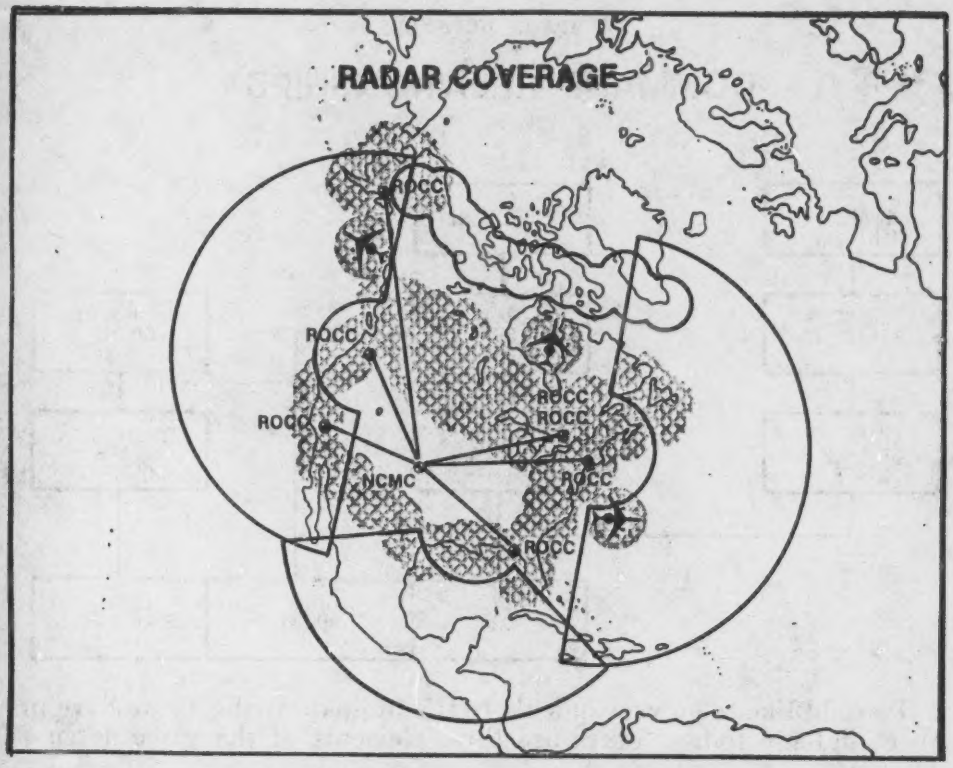
We have spent a great deal of time looking at space-based radar and finally have come reluctantly to the conclusion that it is simply not going to be available in this decade. So, we have opted to go with enhancing the DEW line. The DEW line today is old, is getting increasingly expensive and difficult to maintain. We have to do something about it.

If we do this in combination with the OTH-B we will then have recreated a belt of tactical warning around North America that we think is critical.



The second element of the joint United States-Canadian air defense policy statement was to control access to North American air space. Those microwave radars do not do a very good job of tactical warning, but they are required to control access to North American air space. They are depicted here.

We are also in the process of replacing the old blockhouses that have been in the air defense system since the late 1950's with new, modern, computers in region operation control centers. The first one of those has just reached its initial operational capability on March 1, and the balance of the system will be completed this year.



When you put that all together, Mr. Chairman, you have a belt of tactical warning that would insure the survivability of our strategic force and also enable General Hartinger to use the small force of AWACS and interceptors effectively on the basis of the tactical information that he receives.

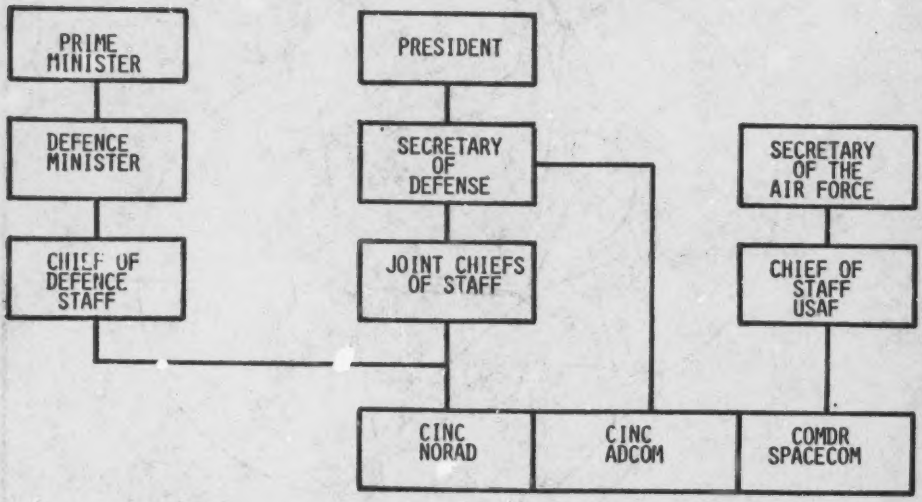
You have an interior boundary that is essentially an air-space control system but also contributes to defense as long as it survives. Then we have the AWACS and the interceptors that will survive an attack and will be able to endure to the postattack phase of a conflict.

[Chart deleted.]

Those interceptors are in the process of being modernized. We have replaced one F–106 squadron with an F–15 squadron at Langley; we have a second F–15 squadron in Alaska. We have four more active-duty squadrons that are programed to be replaced with the F–15. The Canadians are in the process of replacing their CF–101 with the CF–18, and we are looking to an air defense capable version of the F–16 to replace the Air National Guard F–106's and F–4's.

SPACE DEFENSE

COMMAND RELATIONSHIPS



I would like to go very quickly to the limited capability we have in space defense today. There are three elements of the space defense mission.

SURVEILLANCE

Detect, track, identify, catalog and maintain status.

The first is space surveillance. That is the job we have been doing for about 20 years, maintaining the Space Catalog. It is the basis for everything we do in space.

There are about 4,800 objects in space today and we take about 30,000 observations a day from a worldwide system of ground-based sensors to maintain that catalog.

PROTECTION

Assess threats, warn and verify attack.

The second element in space defense relatively new function, is satellite protection. We now have a Space Defense Operation Center in Colorado Springs that gives us the capability to warn satellite owners or operators of threats to their satellites.

[Chart deleted.]

Then finally the system that Mr. Gardner described, we will have a satellite negation capability—with the advent of the F–15 ASAT.

Senator WARNER. Wait a minute, you dropped off there on that last sentence, with the advent of something.

General BROWN. The F–15 ASAT, antisatellite system which I will discuss later.

SPACE COMMAND

That completes space defense, Mr. Chairman. I would just like, with your indulgence, to give you a short commercial on the most recent development in the space business with the creation of the

newest Air Force Major Command, the Space Command established in Colorado Springs on September 1 of last year.

SPACE COMMAND

Manage, control and protect operational space assets.
Provide developer-operator link.
Focus planning and advocacy.

There are three fundamental functions that we think we are going to provide in the next few years. For the first time we will have a single agency to manage, control, and protect operational space assets.

We think one of our major contributions is going to be in intensifying the developer-operator link. One of the principal criticisms of space systems today has been that they are elegant engineering products but there has not been a sufficient operational consideration in their design and they tend therefore to be elegant devices but they have little survivability. General Hartinger describes this as providing the operational pull to go with the technology push which has characterized the space business since its inception.

Senator WARNER. General, let me interrupt you. On that Space Command, refresh my recollection. Just a rough outline to the TO and they chopped. What is the line of report?

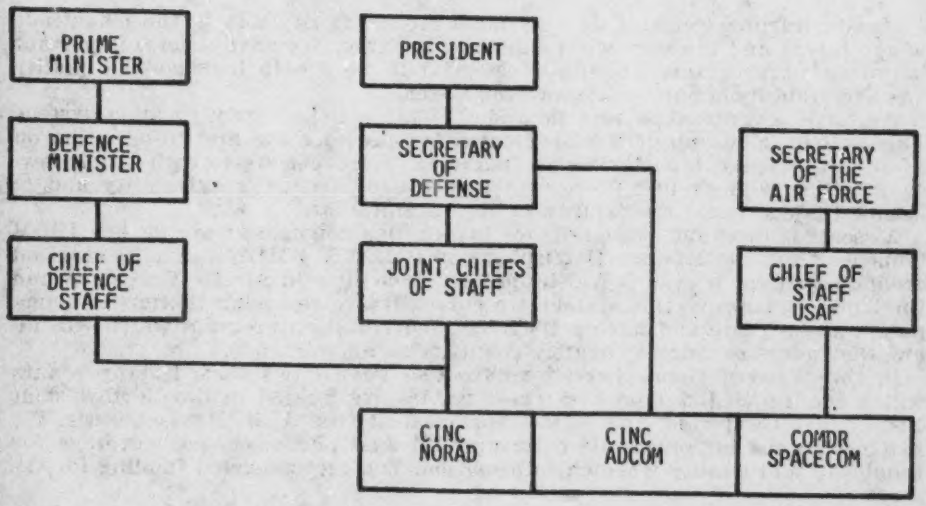
General BROWN. Right now it is a major command of the Air Force. It is a resource management command and the line is through the Chief of Staff to the Secretary of the Air Force. We think it is going to provide the eventual basis for evolving into a unified or specified command, but that has not yet happened. If that is not clear?

Senator WARNER. No, that is clear. And its relationship to your command, now?

General BROWN. It is in fact the Air Force Major Command in Colorado Springs. If I may use the slide, I think it will be easier to explain.

Senator WARNER. All right.

COMMAND RELATIONSHIPS



General BROWN. With respect to air defense which is the mission of the North American Aerospace Defense Command, General Hartinger is responsible equally to the Prime Minister of Canada and the President for the defense of North America through the Chief of Defense Staff and the Minister of National Defense in Canada, and the Joint Chiefs, the Secretary, and the President in the United States.

The U.S. component of that command is a specified command, Aerospace Defense Command. General Hartinger is responsible to the Secretary of Defense, as are all the unified and specified CINCS. This is the Space Command over here, which is a pure Air Force organization at the moment.

Senator WARNER. Thank you.

SPACE POLICY

General BROWN. Finally, we think that the new Air Force Space Command will ultimately provide us a mechanism to accomplish the objectives that were described by President Reagan last 4th of July at the Shuttle landing when he announced the new national space policy.

That concludes my briefing, Mr. Chairman.

[The prepared statement of Maj. Gen. Bruce K. Brown follows:]

PREPARED STATEMENT BY MAJ. GEN. BRUCE K. BROWN, VICE COMMANDER-IN-CHIEF AND ASSISTANT VICE COMMANDER, SPACE COMMAND

On behalf of General Hartinger, I would like to thank you and the Members of your committee for the support you've given us during the past year. I appreciate the opportunity to provide an update on our strategic defense modernization efforts, and in addition, I would like to give a brief report on the Air Force's new command, Space Command, and its impact on strategic defense. It has been a great year for us in Colorado Springs with the establishment of our new command. First, however, I would like to discuss the three mission areas of air defense, space defense and missile warning.

Underpinning our improvements in these areas is President Reagan's five point strategic modernization program. Two of his five points apply to strategic defense: command, control and communication systems, including missile warning, and improved air defense.

MISSILE WARNING

Missile warning remains as our number one priority due to the magnitude of the threat and the very short timelines involved. We have several important improvement programs which are essential if we are to increase the quality and survivability of our missile warning systems.

We have programed several upgrades to the satellite early warning system. This system, made up of infra-red satellites, provides the first information on a missile or space launch. We are pursuing improvements to both the follow-on satellites and ground processing stations to increase survivability and to assure the continued availability of the satellite data.

A second program, designed to insure unambiguous warning of ICBM launches from the Eastern Hemisphere, is BMEWS. BMEWS is a 20 year old ground-based radar system which operates from sites in Alaska, Greenland and England. To improve this system, we currently are replacing the mission computers at each site and have a BMEWS modernization program which will allow the radars to more accurately count incoming warheads.

In the Western Hemisphere, we have two Pave Paws phased array radars which confirm SLBM launches. These radars are located in the Northwest at Beale AFB, California, and in the Northeast at Otis AFB, Massachusetts. We still need some improvements to insure full dual phenomenology coverage for reliability and quality warning information. You recommended funding for the

Southeast and Southwest Pave Paws sites in the fiscal year 1982 budget. Major funding for these two sites began in fiscal year 1983 and continues in the fiscal year 1984 budget. We need 6db power upgrades to our existing Pave Paws sites so they also will more accurately count incoming warheads.

ATMOSPHERIC DEFENSE

To revitalize strategic defenses, the President's program calls for an upgrade to our North American Air Surveillance Network, the procurement of 12 additional AWACS aircraft, and the modernization of our active interceptor force with F–15S.

As a first step, we need an improved atmospheric early warning system to let us see bombers and cruise missile carriers at extended ranges. To get the early warning we need off our coasts, we are going to deploy over-the-horizon Backscatter (OTH–B) radars. OTH–B eliminates the line-of-sight limitations of conventional radars by reflecting its energy off the ionosphere, giving it all-altitude bomber detection out to about 2000 nm. we plan to deploy an OTH-B on each coast by the middle 1980s, and later, to fill the void to the south, we are looking at deploying a southern looking OTH-B.

Since an OTH-B looking north would be degraded by aurora interference, which disturbs the ionosphere, we are pursuing an improved DEW line. This upgrade consisting of minimally attended and gap filler radars will give us an all-altitude bomber detection capability to the north. These programs are contained in the President's 1984 budget.

We feel that with OTH-B and the improved DEW line we will be able to deny the Soviets that no-warning bomber option that might be attractive to their war gamers; and with the system, be able to more intelligently and efficiently employ those limited numbers of interceptors and AWACS aircraft now at our disposal.

We are also modernizing in the airspace control area by replacing the region control centers associated with the old sage system with new centers. This system will provide primary command and control in a wartime scenario as long as it survives; however, as it is not survivable, we are depending on AWACS to give us war-fighting survivability.

This control will be assisted by our damage limiting and assessment capability which is embodied in our interceptors. We currently have 19 squadrons which include Air Force and Air National Guard F–106s and F–4s, Canadian F–101s and the F–15. The F–15 squadrons at Langley AFB, Va., and Elmendorf AFB, Alaska represent the first steps in the modernization of our interceptor force. The Canadians are replacing their CF–101s with the much improved CF–18, and we are looking at replacing the Air National Guard F–106s and perhaps some of their F–4s with an air defense version of the F–16.

Hand-in-hand with these improvements is the need to preserve the flow of critical missile warning information to the users. We must have an enduring C^3 system to sustain our war fighting capability. For that reason, I strongly support development of jam-resistant secure communications, the ground wave emergency network, milstar, and efforts to EMP-harden critical facilities.

In the interim, we at NORAD have done three things. First, we are developing a rapid emergency reconstruction team called Rapier to reconstitute at preselected locations in the Rockies with communications gear.

Second, within the Colorado Springs area, we have completed an EMP-hardening project that runs from Cheyenne Mountain to Peterson AFB, to NORAD headquarters, and to General Hartinger's quarters. This project includes an AFSATCOM terminal, interbase radio system, microwave system and fiber optic cable telephones—all of which insure connectivity between Cheyenne Mountain and General Hartinger anywhere in the Colorado Springs area.

Third is the BUF (back-up facility) on Peterson AFB which will also be part of the hardened system and which replaces our inactivated alternate command post at Malmstrom AFB, Montana.

SPACE COMMAND

Next, I'd like to spend a few minutes on the Air Force's newest major command, Space Command.

Establishment of the Space Command on 1 September 1982, I think marked a crucial milestone in the evolution of military space operations. The Space Com-

mand will give the Air Force an organization to take advantage of the countless opportunities that space afford the military.

Why did the Air Force establish a Space Command? Our perception of space has changed. Space is just a place—like the land, the sea, and the air—another dimension. And it was just a matter of time until we started treating it as such. We have had an on-going study in the Air Force looking at when we would need an operational Space Command and several factors converged in 1982 which led to that decision.

These factors included the Soviet threat in space, our Nation's increasing dependence on space systems, an ever increasing national space resource commitment, and the need to take full advantage of the space shuttle to enhance man's presence in space. Lastly, on July 4, 1982, President Reagan announced that the most important goal of the United States space program was to strengthen national security. As a result, we now have a policy which underscores the need to move Air Force space programs out of the research and development community into the operational world.

The Space Command agenda is far-reaching. In general, the Air Force has an operational command to manage, control and protect operational space assets. Space Command is promoting a much closer relationship between the research and development community and the operational world. The command is providing a focus for centralized planning, consolidated requirements, and an operational advocate for Air Force space systems. In general, we will provide the operational pull to go along with the technology pull which has been the dominant factor in the space world since its inception.

In particular, Space Command will:

Develop space doctrine and strategy.

Promote a comprehensive documentation of the Soviet space threat.

Strengthen the softest link in the space system cycle—the statement of operational needs.

Incorporate space activities in Air Force and joint exercises.

Advocate a sound survivability program.

Promote and oversee space education, training and career development.

Give clearer focus to the Air Force space medicine program.

The bottom line is that the establishment of space command means that Air Force is going operational in space. We think we have the right time, we think we have the right place, we think we have the right people and we are all excited about it. The space command is a giant step toward meeting the President's policy of having a space program that will strengthen national security.

THE FUTURE

I want to conclude with two observations. First, the Air Force's Space Command is the initial step which could lay the foundation for the eventual integration of space systems into the unified/specified command structure.

Secondly, as we look at the future of strategic defense for increased capability and survivability, everything points to space. More and more missile, space and air defense business will be done using space based systems. Space may provide viable options for a more strategic defense oriented national strategy which could create a more stable world.

Senator WARNER. Thank you, General Brown.

Gentlemen and ladies, in view of the uncertainty of the Senate schedule—the social security bill is now pending—I think we had better proceed to an executive session.

I beg your pardon, we will remain in open session. One Senator has put in a request to ask questions in open session.

Yesterday in another subcommittee, General Brown, we have dealt at length with the procurement of the F–15. It seems to me that was one of the things Senator Levin was interested in. I will wait until he joins us.

HIGH FRONTIER

General Tate, let us go to a program known as High Frontier. The subcommittee asked today to receive a briefing, but time did not permit

it. We will as a subcommittee, however, provide the proponents of this program an adequate opportunity to be heard because the program does merit serious consideration by the Senate.

Have you, General Tate, had an opportunity to look at the High Frontier program?

General TATE. Yes, sir, I have. I have received a briefing and read quite a bit about it.

Senator WARNER. Now, what is your judgment with respect to that program and the ABM Treaty?

General TATE. Mr. Chairman, the treaty as it is currently written does not permit ballistic missile defense systems or ABM systems that are based in space. That is, I think, fairly clear in the language.

Senator WARNER. So the proposals under the concept known as High Frontier could only be implemented if in fact this Nation decided to abrogate that treaty?

General TATE. Well in total, yes, sir. The High Frontier study does include both space-based and ground-based elements in all the proposals that I have seen. They do have a terminal type defense as well, either guns or rockets of some type.

But the upper portion, the upper layer of those defense concepts does involve space-based systems.

Senator WARNER. That would be in conflict with the treaty.

General TATE. That would be my understanding.

Senator WARNER. So, either you abrogate the treaty or substantially seek modifications in order to accommodate those elements?

General TATE. Yes, sir.

Senator WARNER. What about the lower systems?

General TATE. The ones at lower altitude would depend upon the specific system implemented. If it used missiles, there would be a limitation of a hundred missiles in consonance with the treaty.

Senator WARNER. Mr. Gardner, to what degree are programs compatible with the High Frontier concept now being funded by the Department of Defense?

Mr. GARDNER. Mr. Chairman, the design of the systems that have been suggested by the High Frontier do take advantage of some of the research and development work going on in the current program.

As you may or may not know, the space-based component of that defense does postulate the use of defensive interceptors that take advantage of the technology that is currently being developed as a part of the antisatellite program that myself and General Brown just recently described to you.

Senator WARNER. At what point, under the administration's plan, would prudent reasonable risk reduction be possible with respect to development of such components in a layered defense system?

ABM TREATY

Mr. GARDNER. I think the best way that I can answer that is to say that before a system of the kind described by the High Frontier could be tested, we would have to confront the question of the ABM Treaty.

The ABM Treaty prohibits testing such a space-based system. So, we cannot proceed much further than we are currently proceeding before we would confront the bounds of that treaty and would have to stop further work.

Senator WARNER. Again, Mr. Gardner, as you know the Congress is likely to make some serious downward adjustments in the defense budget. I am not suggesting that I am a part of that effort to any large degree, but we must in the hearings begin to plan for such a contingency.

To the extent that it will be difficult, if not impossible, to add funds to the President's request, have you identified programs in the defense budget which enjoy a lower priority than funding for elements of the High Frontier concept?

Mr. GARDNER. No, sir; we have not.

Senator WARNER. Would you recommend to the committee that other strategic defense procurements or strategic offensive forces be foregone in order to bring in elements of the High Frontier capability?

Mr. GARDNER. No, sir; we would not.

Senator WARNER. Mr. Gardner, would you describe the findings of the study conducted at the request of the Army and the Office of the Secretary of Defense of the technology and costs involved in the High Frontier concept?

Mr. GARDNER. Yes, sir. I believe I can do that, Mr. Chairman.

We have conducted studies, both in the Army and in the Air Force, on the High Frontier concept as we understand it. Generally those studies were associated with understanding the concept, identifying the technical issues and risks; doing work to optimize the system and estimating the cost for a deployed system as well as its survivability.

Let me say that in order to describe it fully would take some considerable time. But just in summary let me say that it was the judgment of the people that have done these studies and ourselves that the technology content of the High Frontier system appears to be certainly feasible and not extraordinarily risky, although developed components are not available in our mind.

The system does appear that it is certainly technically feasible, although components have not been demonstrated that would be suitable for its operation.

We have done optimization studies on the system. Based on those studies and estimates of the cost we believe that the system cost for such a deployment could be extensive. Estimates range from $50 to $75 billion or more for a deployment comparable to that identified by the High Frontier.

While we believe that the technical capabilities of the system are certainly appropriately described by the High Frontier, we do have some reservations about the survivability of a system of the kind that has been described.

Before we would recommend a significant undertaking on a system like the High Frontier we believe that significantly more work would have to be done in the examination of that system from the viewpoint of its survivability and considering the kinds of responsive threats that might come at that system from the Soviet Union, were they to conclude that it represented a military threat.

So, we believe that there would be a considerable amount of work yet to be done before this Nation should undertake a system of that kind.

Senator QUAYLE. I wonder if you might specifically state, what element of risk do you feel is associated with the key components of such a system? Can you define the risk aspect?

Mr. GARDNER. We have looked at system components in some detail. I would say that of the various elements of the system the spacecraft, the search and acquisition system and the interception system—I believe that the judgment is that the highest risk would exist in the interception system and in the command and control that would be required to drive and control the whole system.

So, the risk would fall primarily in the C^3 system and in the details of the interception system.

Senator QUAYLE. In addition to the technology development issues, what other major uncertainties were identified in the course of this study?

Mr. GARDNER. Cost. There is a considerable amount of uncertainty relative to the cost of such a system.

Senator QUAYLE. Is there any way we can get a better handle on the cost because this is going to be something that might be of interest to some of the people up here on the Hill.

Mr. GARDNER. Well, we have made estimates of the cost of such a system, using the costing techniques that are common to the Department of Defense for both defensive systems, space launches, and satellite systems. It is on the basis of the cost estimates that estimates have been made ranging from $50 to $60 billion, and to numbers considerably in excess of that.

It is possible, of course, to refine those numbers but that can only be done after a significant amount of more detailed work is done on the definition of the system and the identification of the tasks required to bring such a system into existence.

Senator QUAYLE. Senator Levin?

Senator LEVIN. Thank you, Mr. Chairman.

General Brown, I have a couple of questions for you on the F–16's in the air defense issue.

F–16 FOR AIR DEFENSE

In updating our continental air defense, what priority would you assign to the radar upgrades compared to buying the F–15? Would you say it is a higher priority, about the same, or a lower priority?

General BROWN. You are referring to the air surveillance radar?

Senator LEVIN. Yes.

General BROWN. I do not think there is any question that we think the No. 1 priority in air defense today is to establish that belt of tactical warning that provides the tactical warning and attack assessment to insure the survivability of the strategic forces. So, in air defense our No. 1 priority is the fielding of the OTH–B east and west, and the enhanced DEW Line to the north to provide that tactical warning.

Senator LEVIN. If we had the enhanced F–16's now, would we acquire them for air defense?

General BROWN. Instead of the F–15?

Senator LEVIN. Yes.

General BROWN. I do not think that would be our recommendation. I think the F–15 from the standpoint of an effective air defense

weapons system, is superior to even what we hope will be the air defense-capable version of the F–16.

Senator LEVIN. Are we going to use any F–16's, upgraded F–16's, for air defense? Assigned to the National Guard specifically for air defense?

General BROWN. Yes, sir. It is our plan to use the air defense-capable F–16 as a replacement for the remaining F–106's and F–4's that are currently in the Air National Guard.

Senator LEVIN. I presume that is going to adequately perform the air defense function if it is going to be assigned to the National Guard for that purpose?

General BROWN. The reason I hesitated in answering the question initially was that that commitment is contingent upon the performance required. As you know, right now it does not have a good all-weather defense capability and we are watching with great interest the modification of the airplane to develop that capability.

Senator LEVIN. Assuming it develops that capability and we are expecting it to, do you then believe that it is going to be adequate for the air defense purpose?

General BROWN. Our view is that the mix of U.S. F–15's, the Canadian forces' CF–18's and air-defense capable F–16's will provide a reasonable air defense capability.

Senator LEVIN. Will the F–16 provide a reasonable air defense capability with that update?

General BROWN. If it performs according to specification it will provide an effective air defense.

F–16 VERSUS F–15 OPERATING COSTS

Senator LEVIN. How much cheaper is it to operate the F–16 than the F–15?

General BROWN. I will have to submit that for the record, Senator Levin.

[The information follows:]

COST TO OPERATE

In fiscal year 1984 the cost per flying hour for fuel, supplies, and depot maintenance support for the F–15 is $3,534.00; for the F–16 the cost is $2,171.00 per flying hour.

Senator LEVIN. Do you have any reason to believe that it is not going to meet specifications?

General BROWN. I think there has always been a concern that there are uncertainties about it, given the growth capability of the airplane. But I think the improvements that have been suggested certainly seem reasonably capable of attaining them.

Senator LEVIN. Are they on schedule? Do we have an IOC for those improvements?

General BROWN. I do not know, Senator. I should point out that the actual procurement of those airplanes is a function of the Air Force Tactical Air Command which is the resource manager for air defense. They are much more involved in the details of that development than we are in Colorado Springs.

We certainly track it but I would have to provide that detail for the record.

[The information follows:]

F–16 IMPROVEMENTS

The fiscal year 1984 President's budget includes funds to initiate the modification of 132 F–16A/Bs for air defense. This modification will give these aircraft the radar missile (AMRAAM) capability required for the defense role. Initial deliveries of AMRAAM capable F–16s to air defense units will begin the second quarter of fiscal year 1987 with full equipage of the first operational squadron (IOC) in the second quarter of fiscal year 1988. At this time, we have no reason to believe this schedule cannot be met.

Senator LEVIN. Has any information come to your attention that that upgrade is not on schedule?

General BROWN. No, sir.

Senator LEVIN. Do you know what the scheduled date for that is?

General BROWN. I know generally that in the mid-1980's we will know enough about the airplane to make additional judgments as to whether or not we are going to be able to do what we want to. But I do not know whether there is a specific IOC or how we stand.

Senator LEVIN. General, your statement this morning reads as follows in part on page 3, "We feel that with OTH–B and the improved DEW line we will be able to deny the Soviets that no-warning bomber option that might be attractive to their war gamers."

What do you base that statement on?

General BROWN. On the ability to deny, or the fact that the option exists?

Senator LEVIN. How confident are you of that statement?

General BROWN. We are quite confident and getting more so every day because there has been some uncertainty about whether or not we were going to be able to provide with sufficiently high confidence recognition of a raid consisting of a small number of bombers.

But given the performance of the experimental radar site during the year that it was in operation, coupled with the analyses we have done based on what we know about normal peacetime traffic, I think we are willing now to state unequivocally that any bomber raid of sufficient size that could do significant damage to our strategic retaliatory forces would be detected almost as a certainty, certainly 0.99 or thereabouts.

Senator LEVIN. Is that statement true, regardless of the types of interceptor aircraft that we deploy in the air defense role?

General BROWN. We differentiate between the ability to deter a no-warning bomber attack by detecting it and the ability to defend against or defend it. The thing that concerns us today is, given the reduced number of microwave radars we have today, there is little doubt that if the Soviets chose to, for whatever purpose they might have in mind, they could underfly today's air defense radar with relatively large numbers of airplanes and be absolutely certain that they would not be detected by radar.

So, deterring the attack by removing that certainty, by adding sufficient uncertainty so that it is no longer attractive, is of course an entirely different question from the question of defending against it.

Senator LEVIN. You are denying them the option with that improved radar.

General BROWN. Yes, sir.

Senator LEVIN. That option is no longer open to them.

General BROWN. It will not be open to them once we have OTH–B and the enhanced DEW line deployed.

Senator LEVIN. The option is no longer open to them. Is that not true whether we use an F–16 or an F–15?

General BROWN. Yes, sir. From the standpoint of deterring the attack we will depend on the belt of tactical warning that will remove the certainty that they have today.

Now, the second question of how well can one defend against that, that is a separate issue.

Senator LEVIN. You said that today they could do it. With what degree of certainty?

General BROWN. From the standpoint of the air defense system, I think it is almost——

Senator LEVIN. Of not being detected. What is the certainty of not being detected today?

General BROWN. A well-conceived and well-executed attack could avoid detection almost with certainty. There is a very high probability that they could do that if they chose to.

Senator LEVIN. And with the improved radar?

General BROWN. The probability of their being able to do that is reduced to almost zero.

Senator LEVIN. And so when you say that the option would be denied, that is the option you are referring to.

General BROWN. Yes, sir. The notion is that we want to be able to provide sufficient tactical warning to insure the survivability of the strategic retaliatory forces. That, of course, derives from warning and not from defense.

F–15/F–16 MIX

Senator LEVIN. Now, my question to you about if the F–16's with enhancement, if they were available that you would be buying them. Your answer was that would not be your recommendation.

General BROWN. Not instead of the F–15's but as a supplement to the F–15's. I think the combination will make a reasonably effective air defense.

Senator LEVIN. Well, are we going to buy F–15's for air defense once we have the F–16's enhanced available?

General BROWN. I think by that time we will have the six squadrons of F–15's in North America, and then we will supplement them with the air defense-capable versions of the F–16's. So, there are no plans to buy F–15's beyond the current six squadrons.

Senator LEVIN. Why would we buy F–16's instead of F–15's, even with their enhancements, if you do not think they are as good a plane?

General BROWN. Well, they are cheaper.

Senator LEVIN. Well, then why would we not buy them now if they were available?

General BROWN. The F–15/F–16 originally derived from the old high-low mix idea that you buy a limited number of very capable interceptors but you cannot afford to buy enough of them to provide sufficient mass. So you will supplement with a lesser capable airplane which the F–16 was intended to be.

That was essentially for the tactical air forces, the idea of high-low, but it makes a certain amount of sense in air defense as well.

Senator LEVIN. What mix would you buy today if we had both available?

General BROWN. I do not know, Senator. It has been so long since we have gotten into the force effectiveness business. We long ago explicitly gave up the ability to defend effectively against bomber attack so that I do not know if there has been an air defense analysis that would answer that question specifically.

UNITED STATES-CANADIAN AIR DEFENSE POLICY

There certainly have been analyses to determine what is the relative ranking of capability among interceptors. But as I mentioned in my briefing, the current joint United States-Canadian air defense policy statement is very explicit about forces. It says the two countries want to deploy an air defense surveillance system sufficient to provide tactical warning and attack assessment that will insure the survivability of the strategic forces.

And then it says very explicitly,

> Using forces that we buy for that purpose, we will then control access to North America and attempt to limit damage to the maximum extent possible.

And even that statement is confined to strategic retaliatory forces and strategic C³.

So, we really do not talk very much any more about what it would take to effectively destroy an attacking bomber force. We deter by insuring that they cannot attack without being detected, and then we will apply whatever forces we have to extract the maximum we can from that attack.

Senator LEVIN. The detection by these advanced radars assures the survivability of our strategic forces.

General BROWN. Just as missile warning assures the survivability of those forces against ballistic missile attacks.

Senator LEVIN. I did not get your answer. Is the answer yes?

General BROWN. Yes, sir.

BACKFIRE BOMBER

Senator LEVIN. One other question. Do you consider the Backfire bomber a long-range bomber now?

General BROWN. Do I personnally?

Senator LEVIN. Yes.

General BROWN. Yes, sir.

Senator LEVIN. You treat that now as a long-range bomber.

General BROWN. I consider it a long-range bomber because it is capable of being a long-range bomber. But in the calculus of the air defense business it does not make any difference. If I were a Soviet planner I would not use it. If I wanted to underfly today's radars, I would use their old very long-range propeller-driven Bear bomber.

I do not need to go first. I want to go low enough so I will not be detected. So, whether or not the Backfire is an intercontinental bomber does not really affect the calculus of air defense.

Senator LEVIN. That is not the reason why we are buying F–15's now because the Backfire provides us a long-range threat now before we can get the F–16 enhanced?

General BROWN. The principal reason for buying the F–15 is to give you the extended range and large volume search-radar to be able to take advantage of that long-range tactical warning when you choose to go out at extended ranges and do the visual ID when you think you have to, principally to counter the air-to-surface missile carrier. It will have the capability to stand off at long ranges and launch its air-to-surface missiles.

Senator LEVIN. So, what you are saying is, that the reason for buying the F–15's now is not the Backfire threat.

General BROWN. No, it is not. The principal reason is the 106's are 25 years old and they are getting very, very difficult to maintain. They have to be replaced. The F–15 is certainly, by every analysis that has ever been done the most capable air defense interceptor in the Air Force.

Senator LEVIN. Well, we are getting two very different justifications, Mr. Chairman, for proceeding with F–15's at this time. I appreciate the general's statements this morning, they are very helpful.

I must say in principle I think they are significantly different from what we have received in the Tactical Subcommittee where the Backfire threat is the argument because allegedly there is this gap between the time we can get the F–16's enhanced.

We can take that up later on, but I do think that this testimony has been helpful this morning and I appreciate the general's candor.

Senator QUAYLE. Do you want to go ahead and continue with any questions? If there is this discrepancy I think that perhaps it might be good to clear it up for the record, as Senator Levin pointed out. If there is any additional information, you might want to give it to the committee.

Senator QUAYLE. Senator Nunn?

Senator NUNN. No questions.

HYPERVELOCITY WEAPONS

Senator QUAYLE. I have a couple quick questions. Can you give me a status report on the R&D that has been done on the hypervelocity weapons, where we stand?

Mr. GARDNER. Let me see if by hypervelocity weapons you mean nonnuclear kill missile systems.

Senator QUAYLE. Yes. And as I understand, the technology would be somewhat as a substitute for an alternative to the laser, some capacity. It is not just nonnuclear.

Mr. GARDNER. Let me make sure I understand the question.

Senator QUAYLE. You are aware of the general area of the hypervelocity weapons, right?

Mr. GARDNER. Yes, I am.

Senator QUAYLE. Can you spell out what we are doing precisely in those areas?

Mr. GARDNER. Let me attempt to do so. There are two classes of hypervelocity weapons that are currently being considered. Perhaps General Tate can expand on this answer in a minute.

One class of those weapons are hypervelocity pellets that are carried on board missiles, that are guided to the vicinity of the target. Then those hypervelocity particles are detonated and expelled from the missile and they impact an RV and destroy it.

The other class of systems, of hypervelocity systems of this kind, are systems in which those pellets are expelled essentially by guns propelled by various means—either by chemical detonations like a rifle bullet or by electromagnetic acceleration that accelerates the pellet by electromagnetic means.

We currently have research and development going on in both of those classes of systems as well as several approaches in each area. Perhaps the most extensive program that we have ongoing now is a homing overlay experiment, a long-range exo-atmospheric interceptor which I can describe to you more in closed session.

But let me just say that it is currently being experimented with, tests are ongoing. The overall approach looks promising. In addition to that, there is a significant amount of research that is being initiated and ongoing, both in the Army as well as in DARPA on electromagnetic guns.

There is promise that that technology will provide a useful defense capability against ballistic missiles.

Grayson, would you like to expand on that answer?

LASER WEAPONS

General TATE. You made the statement, Senator, that these might be replacements for laser weapons. Of course, we do not have any weapon that approaches the speed of light, I am sure you are aware of that. We do have weapons that have much higher velocity than some of those that we have talked about in the past, particularly in regard to quick acceleration.

Senator QUAYLE. I think it comes down to the cost as far as looking at an alternative. Lasers would be considerably more costly than high velocity weapons.

General TATE. We have very little work going on, on what we have classically defined as hypervelocity weapons. We have the weapons that Mr. Gardner mentioned, some of which are experimental now. They do have quite high velocities but they are not generally of the class of weapons that I normally consider hypervelocity.

I am groping a little bit with the specifics of your question.

Senator QUAYLE. Well, I am just curious on whether we are proceeding. I have had a briefing and some discussion on the potential of the hypervelocity weapons. I was just trying to get a feeling on whether we are moving ahead and what you think about it.

I know as far as the cost basis that there is a considerable cost differential between hypervelocity weapons which could be used for the same mission and the same mode as laser weapons. That is what I am trying to extract from you, whether the kind of commitment, the kind of R&D and where we are going, or if this is just an idea that is just sort of sitting over there and not receiving much attention.

Mr. GARDNER. In my remarks on the High Frontier system design, of course, a system like that takes advantage of hypervelocity impact

in much the same way that the antisatellite system which I described earlier also takes advantage of hypervelocity impact.

MAJOR COST DIFFERENTIAL

The question of whether or not a system of that kind saves money I think is quite argumentative compared to, for example, a laser system. Based on the examinations that I have seen of the subject, the issues of the cost of the system are dominated by the number of spacecraft that have to be procured; the complexity of those spacecraft, and the number of munitions that are found on it.

Those costs have to be compared to laser-based systems which have only been looked at in, I guess, a preliminary fashion at this stage of the game. As General Lamberson said, "A system concept definition work was not included in the budgets last year." So the definittion of those laser systems is less well understood than we would like.

But nevertheless, it would appear that it is not clear that there is a major cost differential between laser systems, for instance, deployed in space that might be deployed in fewer quantities, and hypervelocity impact systems that would tend to be deployed in greater quantities. The cost per quantity of the laser system might be greater but that might be offset by the fewer numbers required.

So, it is an argumentative point.

Senator QUAYLE. Let me ask one more question and then I will yield to Senator Nunn and Senator Levin.

ASAT SYSTEM

General Brown, as you are probably aware, there are a number of Members of Congress that circulated a letter calling for the deferral of the ASAT system operational tests on the grounds that once tested such systems would pose problems for verification with the Soviet Union.

Is this a contention that we should be concerned about and perhaps if it is, what are our efforts and the status of negotiations with the ASAT warfare ban with the Soviet Union?

General BROWN. Mr. Chairman, I cannot testify as to the status of the negotiations. I can certainly give you the view of the operational commander with respect to the wisdom of deploying the ASAT.

I think our view is very straightforward. The Soviets have had an operational ASAT for many, many years. We have seen them operate it. We know it is successful. It only applies to low Earth orbiters today but there is no reason that the Soviets cannot put that on top of a more powerful booster and get out to synchronous altitude almost any time they want.

If they have an ASAT and we do not, there certainly is the prospect that they then have a sanctuary in space. They can deny our access to it. We do not think that is very wise. We feel very strongly that we are well behind the Soviets in the development of an operational ASAT and that we ought to do that.

Senator QUAYLE. What about the verification problems that might emerge? Is this going to be a problem for verification if both countries proceed?

General BROWN. I do not know enough about it.

Senator QUAYLE. Should we not be concerned about that?

General BROWN. I really do not know. If we can put wing fillets on B–52 ALCM carriers, perhaps we can do the same for some sort of F–15 ASAT carrier. I do not know.

I suspect we now have exactly that same problem in verifying what the Soviets have. We cannot count silos or launch emplacements to determine how many ASAT's they have, or whether they have any at all.

So I would guess that we already have the verification problem with respect to the Soviets and we are not complicating it by deploying one of our own.

Senator QUAYLE. But would we not be complicating the verification problem? We have problems now. Would this not add to it as far as verification which, I think, is always part of any kind of an arms treaty and also one that is of very much concern to us as a policy?

General BROWN. I really cannot talk to the policy side of that other than from my limited perspective. I would simply say, we already have an imbalance of forces. To say that we should sustain that imbalance because we now also want to sustain an imbalance in verification does not make a lot of sense to me.

Senator QUAYLE. But this would add to the problem of verification. There is little doubt about that, is there?

General BROWN. Well, from the standpoint of the Soviets knowing we do not have one, there is nothing to verify. But as far as our ability to verify their ASAT, it neither adds nor detracts.

Senator QUAYLE. Would we be better off, in your opinion, if we had a ban on the ASAT systems?

General BROWN. You know, to the extent that one can limit arms and make the world a safer place that is certainly, without question, a desirable objective.

To the extent that we become more and more dependent on space systems I think one really has to question—somewhere along the line they tend to be more than important, they can become decisive. Whether or not the United States would be willing to walk away from that capability I do not know. From my standpoint, I think we should not. But that is from the limited perspective of a field commander.

Senator QUAYLE. Senator Nunn?

Senator NUNN. I just have one question, maybe General Brown could furnish it for the record if he does not have the information available now.

F–15 AIR DEFENSE MISSION

In this air defense mission, the new air defense mission, the F–15's that you were talking about, do you have figures showing the manpower that would be involved in that, the active-duty manpower that would be involved beyond what we now have available over the next 5 years?

General BROWN. As I pointed out to Senator Levin, sir, that now—today—is a function performed by the Tactical Air Command, it is the resource manager for air defense. General Hartinger and those of us in Colorado Springs employ those forces.

So, many of the details of resource management we do not pay that much attention any more. I do not have it and I would have to provide it for the record.

Senator NUNN. Could you provide it for the record?

General BROWN. Yes, sir.

[The information follows:]

MANPOWER INVOLVED

The manpower associated with the programed conversion of F–106s to F–15s is four authorizations per aircraft. These additional manpower authorizations are related to the additional wartime tasking and planned deployment of F–15 air defense units. Based on the 90 operational mission aircraft that are included in the conversion program, and additional 360 military authorizations are required for the F–15s over what the F–106s require. This increase is currently contained in the AF program over the next five years.

Senator QUAYLE. Senator Levin?

Senator LEVIN. Just two more questions. Thank you, Mr. Chairman.

CF–18

One, General Brown, the Canadians are buying F–18's, I understand, for air defense. That is a less capable plane than the F–15; is that true?

General BROWN. Yes, sir.

Senator LEVIN. Is that more or less, or about the same capability as the F–16 with the enhancements?

General BROWN. I think it is about the same, very close. The Canadians bought the F–18, the CF–18 because they could only afford to invest in one airplane and it had to be dual capable both to attend to their NATO responsibilities in the strike role in Europe and also to the air defense role in North America. The CF–18 was the best compromise they could come up with.

Senator LEVIN. So even though the F–15 is less capable than the F–18, the Canadians bought the F–18 for financial reasons, just to save money. They could not afford two planes and they wanted to save the bucks that would result from buying one dual-capable plane. So they bought the F–18, is that accurate?

General BROWN. Perhaps I misunderstood your question. You said the F–15 was less capable than the F–18?

Senator LEVIN. If I said that, I misspoke. Let me rephrase it.

The F–15, I gather, is more capable than the F–18.

General BROWN. Yes, sir. In terms of air superiority in the air defense role there is no question about it.

Senator LEVIN. And despite that fact the Canadians bought the F–18 instead of the F–15 in order to save the cost of buying two different planes.

General BROWN. In a perfect world I am pretty sure they would have bought F–15's for North America and something else for Europe, but they could not do that. So the answer is, yes.

Senator LEVIN. To save the money they bought the F–18.

General BROWN. To get more airplanes for the same amount of money.

Senator LEVIN. However you cut it, they got less air defense capability.

General BROWN. They got less air defense capability than they would have if they had bought the F–15.

Senator LEVIN. Do they consider the air defense capability of the F–18 that they bought adequate?

General BROWN. Yes, sir.

Senator LEVIN. Now, one question for General Tate.

INITIAL OPERATIONAL CAPABILITY

On page 5 of your statement you identify an IOC, initial operational capability, for a ballistic missile defense of MX. I am not going to state the date because that is classified, but you do set a date.

General TATE. Yes.

Senator LEVIN. How can you set a date for BMD for MX when we do not know how, when, whether, where, or anything else about the basing mode of the MX?

General TATE. Did you say set a date for MX, Senator?

Senator LEVIN. No; you set a date for BMD.

General TATE. For an IOC?

Senator LEVIN. Yes. I am wondering how you can set an IOC for the BMD when we do not know how, when, whether, what about the basing mode for the MX that the BMD is supposed to protect.

General TATE. Yes, sir. It is true that the final MX basing decision has not been made. However, we have looked at many different concepts and many different employments of ballistic missile defense hardware to be able to protect different kinds of MX basing options.

At this point in time we are still in the options business. We are maintaining a capability to be able to defend MX if it should be decided to deploy it in specific basing options.

Senator LEVIN. You are saying whatever the basing option is, no matter which basing option, that IOC is still good?

General TATE. No, sir, that is not correct. It was primarily laid out during the last 6 months or so in connection with our analysis of the close-spaced basing.

Senator LEVIN. It relates to Dense Pack, that IOC.

General TATE. Yes, sir; right. We are maintaining a capability by the date that you have in mind for that purpose.

Senator LEVIN. But that particular IOC that you have identified relates to the Dense Pack option.

General TATE. It does, although much of the technology would be applicable to other basing modes.

Senator LEVIN. At least some other basing modes.

General TATE. Yes, sir.

Senator LEVIN. Thank you.

Senator QUAYLE. I have one final question for General Lamberson.

SPACE-BASED LASER TECHNOLOGY

Can you recommend to the committee an acceleration of the space-based laser technology program on technical grounds?

General LAMBERSON. Senator, no, I cannot at this point in time. A great amount of thought went into the plan which was submitted by the Secretary last year and which is the plan for space-based lasers

that we are working against. We believe that is a balanced plan which vigorously attacks the technology that needs to be achieved.

In balance with other programs of the Defense Department, we stand behind that plan and would not recommend an acceleration at this point.

Senator QUAYLE. What would be the cost to achieve this significant acceleration, do you have any idea?

General LAMBERSON. I do not know what acceleration you are referring to, Senator.

Senator QUAYLE. Acceleration on getting it on line, an operational system.

General LAMBERSON. I am sorry, without knowing what the specific acceleration would be or specific goal would be, it would be difficult to give you the cost. The cost of the plan that we have submitted to make that decision—that is by 1988—is just under $1 billion.

To do anything more than that, specifically on orbit or any kind of operational capability, would obviously be many times that cost.

Senator QUAYLE. What if you wanted to deploy it by the end of this decade?

General LAMBERSON. Deploy a demonstrator by the end of this decade?

Senator QUAYLE. Yes.

General LAMBERSON. We have not costed that out. It would be many billions of dollars.

Senator QUAYLE. Many billions?

General LAMBERSON. Yes.

Senator QUAYLE. Could you give us that for the record? Try to get it more accurate or precise.

General LAMBERSON. Yes, sir, we can provide that.

[The information follows:]

ACCELERATION OF SPACE-BASED LASER TECHNOLOGY

The report to Congress on space laser weapons, which was sent to you in May of 1981, outlined several options. Page 5–3 of that report shows a milestone and funding chart for option 3, earliest possible feasibility demonstration. The chart indicates that, with a fiscal year 1982 start, program to completion in [deleted] would cost approximately [deleted]. An updated of that estimate would require a major study effort.

Senator QUAYLE. There are no other Senators here for the open session, so the committee will now proceed into closed session.

The clerk will clear the room.

[Whereupon, at 11:17 a.m. the subcommittee recessed to proceed in executive session.]

EXECUTIVE SESSION

Senator QUAYLE. I presume the room is cleared for this closed session.

Are there any additional comments or information that any member of the panel wants to submit at this time?

Mr. GARDNER. We have nothing at this time. We are here for your questions.

General TATE. I have a prepared statement that we submitted to the committee several days ago. I would like to have that entered into the record. It is a classified statement.

Senator QUAYLE. It will be entered into the record.

[The prepared statement of Maj. Gen. Grayson Tate follows:]

PREPARED STATEMENT BY MAJ. GEN. GRAYSON D. TATE, JR., BALLISTIC MISSILE DEFENSE PROGRAM MANAGER

INTRODUCTION

I am Maj. Gen. Grayson D. Tate, Jr., manager of the Army's Ballistic Missile Defense (BMD) Program. I serve as the principal assistant and advisor to the Chief of Staff and Secretary of the Army for all matters pertaining to BMD. It is a pleasure to be here today and to discuss my program with you.

OVERVIEW

In view of current and projected Soviet Intercontinental Ballistic Missile (ICBM) and Submarine Launched Ballistic Missile threats to our ICBM force, a high priority Ballistic Missile Defense (BMD) research and development (R&D) program continues to be necessary. Against the current Soviet threat, BMD can significantly enhance the survivability of our ICBM force as well as other national assets, thus contributing directly to a stable and secure deterrent. As this threat evolves and increases in sophistication, BMD's contribution to survivability and stability become even more pronounced. The BMD program provides an option to deploy a capable BMD system in the near term while concurrently pursuing an aggressive R&D program to maintain this effectiveness against an evolving Soviet threat.

In support of the 2 October 1981 strategic modernization announcement by the President, the BMD program was directed along a steady and systematic development path which provided a wide range of possible deployment options for defense of ICBMs and other high-value strategic assets such as SAC bases, C³ nodes, and the National Command Authority (NCA).

In his November 1982 announcement on the basing of Peacekeeper, President Reagan affirmed the need to provide a BMD hedge against Soviet breakout of the ABM Treaty, and to continue necessary research toward "—the kind of smart, highly accurate, hopefully nonnuclear, weapons that utilize the microelectronic and other advanced technologies in which we excel," in order to provide stability for an ICBM force [deleted]. The plan also directed the program to maintain "—the technical competence to evaluate Soviet ABM developments." These are fundamental objectives of the BMD program.

In the past year great strides were made in the BMD program. In the Sentry program, significant progress was made both on refining system concepts and on component subassembly hardware development and testing. This work increases our confidence that we can successfully maintain a hedge option for defense of Peacekeeper, and ultimately reduce system development leadtimes in the long run. The Designating Optical Tracker (DOT) flight experiment program was successfully completed. The DOT program confirmed that optical sensors can perform the BMD functions [deleted]. The first test flight of the Homing Overlay Experiment (HOE) was conducted in February 1983. [Deleted.] The purpose of the flight was to demonstrate exoatmospheric homing and nonnuclear kill. Three more flights will follow. An aggressive endoatmospheric nonnuclear kill program was initiated and X-band radar data base collection efforts were accelerated. We have begun test programs to incorporate many emerging cost-effective technologies into BMD systems.

PROGRAM STRUCTURE

Within the program, we are attempting to reduce system cost, improve effectiveness, and reduce leadtime in the face of a growing and increasingly sophisticated threat. To accomplish this, the BMD program has been structured to emphasize both technological innovation as well as system validation of new technologies as they mature. Major advances in BMD technology have been

achieved in the past few years, particularly in the capability to use missile borne long wavelength infrared optics to locate and home on attacking missiles.

The current BMD program is structured to insure maximum use of the technological progress of the past two decades and to ensure integration of new technological advances into an evolutionary defense capability. The BMD program objectives today are quite different from those of the 1975–1980 period due to the recognition that a more balanced offense/defense force mix can improve our strategic deterrence. The R&D effort consists of three complementary program elements—the Advanced Technology Program, the Systems Technology Program, and Kwajalein Missile Range.

The Advanced Technology Program (ATP) is a broadly based research and development effort designed to exploit new and emerging technologies, seek improved cost-effective methods, advance the state-of-the-art for future BMD and avoid Soviet technological surprise.

The Systems Technology Program (STP) involves the development and demonstration of a capability to defend hardened strategic targets and other high-value assets. The STP includes an aggressive research and development effort to demonstrate improved capabilities for a full spectrum of defense concepts and to maintain a near-term ballistic missile defense option for ICBMs. At any given time, the option to complete development and deploy the most current components in an integrated system will be available.

Kwajalein Missile Range (KMR) is a national range whose principal missions are to support Air Force ICBM development and operational testing, and BMD development and testing. Using the range for BMD experiments and other testing has a synergistic effect since both the strategic offensive and defensive programs benefit from the data produced. In addition to support of strategic weapons system development [deleted]. Kwajalein is the only range in the free world where ICBMs can be fired to full range in a tactical configuration with sophisticated technical data collection during the terminal portion of the trajectory. These trajectory data are required by both the Army and Air Force to support strategic missile and ballistic missile defense system development, test and validation.

A further discussion of specific ATP and STP programs and the KMR is contained in the Budget Annex.

BMD PROGRAM OBJECTIVES

The BMD program will conduct a vigorous research and development program that supports the President's strategic defense initiatives, contributes to a stable and secure deterrent, and increases Soviet incentives to negotiate genuine arms reductions.

In order to accomplish these broad objectives, the BMD Program will:

Maintain an ICBM defense hedge option for a [deleted] IOC with Peacekeeper.

Conduct an aggressive R&D program to develop technology for evolutionary system improvements and explore a full spectrum of defense concepts [deleted]. [Deleted.]

Provide an orderly growth path to accommodate advanced threats.

Work closely with the Air Force to integrate offense-defense designs.

Assure adherence to the ABM Treaty.

Avoid technological surprise.

The restructured BMD program aims toward demonstrating a flexible defense capability [deleted]. While not a full scale weapon system development effort, the program is broad based and includes all the R&D necessary to demonstrate, with confidence, exoatmospheric and endoatmospheric system capabilities. As a result, designs will not be frozen at an early date; rather, advanced components will be introduced into the evolving system concepts as the components reach maturity and are demonstrated. In this manner, the capability to advance into full-scale development at any time is maintained should it be required, yet, the program is flexible and constantly evolving to reflect the most advanced technology possible. The technology base, from which will come the means to counter the sophisticated threats of the future, is receiving similar emphasis. The effort cuts across the entire spectrum of BMD technologies and provides the key to avoiding technological surprise.

Major Program Efforts. Main areas of the BMD program include a hedge option for defending Peacekeeper, high altitude defense (HAD) and terminal defense. Each category is addressed below:

DEPLOYMENT HEDGE OPTION

In this area we intend to establish and maintain BMD capability to deploy a tactical system with minimum leadtime. [Deleted]. When combined with other program activities, these efforts maintain the option to field a system by [deleted] for defense of Peacekeeper. The program will be able to maintain the [deleted] IOC capability for [deleted] as presently funded.

HIGH ALTITUDE DEFENSE SYSTEM (HADS)

The High Altitude Defense system is designed to extend the reach of the defense capability above the atmosphere. HADS may be considered as a stand alone defense or layered with terminal systems for specific mission. HAD will establish the requirements for a prototype high altitude system [deleted].

A very meaningful demonstration in developing the technology for high altitude defense is the Homing Overlay Experiment (HOE). The primary objective of the HOE effort is flight test demonstrations of high altitude optical homing and nonnuclear kill. The first HOE flight occurred last February and [deleted] intercept of a reentry vehicle using a nonnuclear kill device.

The Airborne Optical Adjunct (AOA) is a key new initiative which will consist of an aircraft based optical sensor system [deleted] BMD system concepts. Use of the AOA [deleted] will greatly extend the battle space, present an attacker the problem of having to counter dual phenomonology sensors (optics and radar) [deleted]. The system will perform [deleted].

The Optical Aircraft Measurements Program (OAMP) is designed to compile an optical data base [deleted]. The data base is needed to enhance our developmental program for BMD optical systems. Modifications to the OAMP aircraft will commence in fiscal year 1983 in preparation for sensor installation and data gathering flights.

Also, the HADS program will pursue efforts directed toward advancing long wavelength infrared exoatmospheric technologies [deleted] and, in conjunction with Defense Advanced Research Projects Agency, exploration of both [deleted] devices as weapons.

TERMINAL DEFENSE

BMD has initiated a terminal defense (endoatmospheric nonnuclear kill (endo NNK)) program that will allow a decision in [deleted] to demonstrate prototype hardware with nonnuclear kill capability in [deleted]. This nonnuclear capability could be integrated into the defense of ICBMs. The phasing of the system design will effectively integrate evolving technologies and take full advantage of developments expected [deleted]. Efforts will be directed toward [deleted].

[Deleted] and other threat specific systems will be examined and an assessment of their feasibility and utility will be made. [Deleted.]

Sentry continuation efforts include development of ground-based radar/data processing equipment. Further development of a key interceptor component, the digital missile control system, for use with the nuclear or nonnuclear terminal interceptor (or for Sprint or Spartan) is progressing.

Technology base development efforts in microwave solid state transceivers will be focused on X-band and higher frequencies for the purpose of developing a capability to rapidly manufacture and deploy a small X-band phased-array radar which is rugged, will operate from dormancy, and is cost effective.

ARMY/AIR FORCE INTERFACE

To insure an integrated strategic program, the Army and Air Force have established extensive procedures which provide the means to identify necessary ICBM/BMD interfaces and assure that Peacekeeper and its basing mode are designed to accommodate defense. A formal Memorandum of Agreement (MOA) between the Ballistic Missile Defense Program Manager and the Commander, U.S. Air Force Ballistic Missile Office (BMO) was signed on 7 October 1980. In light of changes of the past year, the MOA is being updated. This MOA formalizes the relationship between BMD and BMO, outlines policies and responsibilities, and provides for interchange of technical, operational, and programmatic information. The interface with BMO is BMD's most extensive and productive source of interaction with the Air Force. Specific areas emphasized include engineering development; basing; command, control, and communications; organizational and operational concepts; physical security; and support facilities. A

joint Steering Group has been established and the BMD Program Manager and Commander, BMO, have a formal system for identifying and resolving interface issues. Coordination channels have also been established with the Air Force Strategic Air Command (SAC) and other appropriate Air Force elements. SAC must play a major role in the development of BMD Firing Doctrine to ensure the capability for coordinated operations and in developing organizational and operational concepts.

ABM TREATY IMPLICATIONS

The BMD program consists of a broadly based R&D effort which complies with the provisions of the ABM Treaty. Each program element is screened for potential compliance issues. Questionable areas are clarified in accordance with established procedures and any required adjustments are made in the early program stages.

SUMMARY

The President's strategic program announcements have reemphasized the continued need for an aggressive, broadly based BMD R&D program in developing the advanced technologies needed in areas such as nonnuclear kill and optics. The BMD program is designed to maximize us of extensive research experience in the areas of optics, radars, data processing, and interceptors and to apply evolving technologies to support future strategic policy decisions. Technical demonstrations are planned to ensure feasibility of integrating new technologies into evolving system concepts, for deployment as required by the projected threat.

I have appreciated the opportunity of appearing before the committee and would be happy to answer any questions you may have on the BMD Program.

BUDGET ANNEX

ADVANCED TECHNOLOGY PROGRAM

The Advanced Technology Program (ATP) is a broadly-based research and development effort designed to exploit new and emerging technologies, seek improved cost-effective methods, advance the state-of-the-art for future BMD and avoid Soviet technological surprise. The Advanced Technology Program, will place greater emphasis on non-nuclear kill (NNK) technology, proof-of-principle demonstrations of components required for NNK, and the identification, evaluation, and development of novel concepts and technologies emerging from the US research establishments which have potential payoff for future BMD systems. Program emphasis will also be placed upon [deleted].

The fiscal year 1984 request for the ATP is presented below for major funding areas. The $27.3 million for the high altitude defense includes optical sensor technology and data analysis. Terminal defense, which includes ENNK and the Optical Aircraft Measurements Program (OAMP), is currently planned at $110.8 million. The remainder is planned for technology base and program management.

ATP funding

	Millions
Terminal defense	$110.8
High altitude defense	27.3
Technology base	21.6
Program management	11.2
Total	$170.9

SYSTEM TECHNOLOGY PROGRAM

The System Technology Program (STP) involves the development demonstration of a capability to defend strategic targets and other high-value assets. An aggressive research and development effort to demonstrate improved capabilities for a full spectrum of defense concepts while maintaining a ballistic missile defense option for ICBMs is being pursued. The program is carefully structured to maintain the capability to deploy some BMD components at any time it is deemed necessary to do so while advancing the technology to introduce improved components into the systems that are responsive to current and future threats. Component and subsystem research and development effort required for improved systems that could be deployed [deleted] will continue. The program

maintains a hedge option for defense of Peacekeeper should this become a requirement, provides for increasing effort for non-nuclear kill mechanisms, and examines the viabilities of a class of nonconventional weapons [deleted].

The fiscal year 1984 request for the Systems Technology Program for major funding areas is presented below. The $55.5 million for high altitude defense includes completion of effort on the HOE Flight Test Program and concept definition and critical design effort on a high altitude defense system. The $195.7 million for terminal defense includes the Airborne Optical Adjunct and X-band Data Collection. The $108.5 million for ENNK includes technology and initiation of concept definition for the Nonnuclear Kill Prototype Demonstration program. The $106.3M is for continued development of ground based radar/data processor equipment and missile control electronics and vulnerability and hardening testing for Sentry. The hedge option amount of $40.3 million includes evaluation and effectiveness determination of [deleted] components of BMD deployment option, ICBM/BMD interface, and command/control/communications effort related to final basing mode selected. Program management costs include salaries and related costs of personnel.

STP funding

	Millions
High altitude defense	$55.5
Terminal defense	195.7
ENNK	108.5
Sentry continuation	106.3
Hedge option	40.3
Program management	32.1
Total	538.4

KWAJALEIN MISSILE RANGE

The fiscal year 1984 budget request for the Kwajalein Missile Range is presented below by major categories. Almost two-thirds of the program is required to cover fixed contractual costs associated with the operation and maintenance of the facility. The $92.7 million for contract support includes funds for logistic and technical support, technical direction and operation and maintenance of major sensors, operation of the instrumentation control center, security services and safety analyses. The $24.0 million included under materials/supplies covers reimbursement for petroleum, oil and lubricants consumed for transportation and utilities requirements and funds for Federal Supply System procurements. The $20.71.8 million identified as Government support services represents annual recurring services procured from other government agencies. Categories of support include engineering services, terminal operations, air and surface cargo movements, operation of the air traffic control tower, depot level maintenance of instrumentation radars and payments to the Republic of the Marshall Islands for unincumbered land use. The program management line item of $6.4 million covers pay of personnel, travel, and administrative and logistic support of the management staff.

KMR funding

	Millions
Contract support	$92.7
Materials/supplies	24.0
Government support services	20.7
Program management	6.4
Total	143.8

Senator QUAYLE. If there are no further statements, I will turn the hearing over to the majority and minority staff counsels because I have to depart. Staff will ask more questions.

I certainly want to thank all of you very much for coming this morning and hopefully shedding some light on the issues that the

Senate will be confronting in the weeks and months ahead of us. Thank you very much.

Mr. GAFFNEY. I want to thank the witnesses once again for their forbearance, we have had a difficult day here and it is likely to get worse as the recess approaches.

I have a series of questions that would be helpful if we can answer them now as part of this record. To the extent you wish to answer them in greater detail for the record, fine. But we are inevitably faced with a lag between the time you receive the questions for the record, you answer them and return them to the committee so we have an opportunity to review them before markup.

Sometimes our committee markup schedule supersedes that pace. So, in the interest of trying to make sure that we have as much data as we can to influence the outcome of that markup process, it would be helpful for you to answer questions now.

LASER SYSTEMS

General Lamberson, I think it would be very helpful if you could give the committee an update on your assessment of the development efforts being made by your Soviet counterparts with respect to developing as well as deploying operational laser systems for the range of missions that you have indicated in your previous testimony that may have usefulness.

General LAMBERSON. Yes. We continue to see a significant sizable Soviet research and development activity. The estimates persist that it is several times—I think three to five is a characteristic number—the investment that we make in this country in efforts that are devoted to directed energy research and development. Those specifically directed to strategic defense continue to enjoy growth in the Soviet Union.

I must at the same time, however, say that [deleted].

So, the impression that I must leave is one of a very sizable and very significant research and development technology phase that is noncontroversial within the intelligence estimates. What is controversial is what they specifically are doing with it and what is the status of their weapons development program [deleted].

Mr. GAFFNEY. I believe that a report was developed by the intelligence community recently which indicated that [deleted] would be the case with respect to Soviet development effort.

That is to say, development supporting a weaponization of such a laser system. Would you comment on that, such information as you have available to you with respect to that technology and the degree to which it might be indicative of the useful field of increased activity on the part of the United States?

General LAMBERSON. [Deleted.] It would perhaps be useful for me to submit from our intelligence people for the record a more complete answer to that question.

[The information follows:]

SOVIET DIRECTED ENERGY RESEARCH AND DEVELOPMENT

[Deleted.]

Mr. GAFFNEY. That will be fine.

General Lamberson, as you are keenly aware, the Congress last year elected not to establish a space laser line in the Air Force program. From your perspective as the OSD focal point, would you give us a feeling for the importance that you attach to the creation of such a line, the kinds of work that you feel can only be done through such an Air Force dedicated activity, and the degree to which, if at all, our space laser development effort has been impaired as a result of that congressional action last year?

You mentioned a moment ago the fact that some of the system concept work has not been done. If you would elaborate on that point as appropriate.

General LAMBERSON. Thank you, I would be glad to.

We believe that Air Force involvement is absolutely critical to the furtherance of the space laser program in the Department of Defense. The idea that the technology development at the component level, that we are doing in DARPA, and that was supported and is supported in Congress, is sufficient to make a decision to deploy even a demonstration in space is absolute nonsense. We do not concur in that.

The only reason that we are satisfied at all in the progress in the program is the fact that there were some 1982 funds which were authorized by the Congress last year, to be used during 1983. Those funds allowed the initiation of some baselining activities which do address concept definition work. That, of course, was not augmented as our plan wanted to in fiscal year 1983.

With respect to 1984, if we are not able to sustain and to defend in the Congress that Air Force line and accomplish that parallel activity which is so very, very essential—in vulnerability, in hardening and survivability and utility—then I think we would look very, very closely at the continuation of a technology program which would have no effort to define utility associated with successful achievement of the technology program goals.

So, the answer to your question is that we believe it is absolutely essential to have a balanced program between the technology efforts of DARPA and the systems application efforts of the Air Force program. We certainly request your support of that activity.

Mr. GAFFNEY. Is the Air Force itself supportive of the activity and maintenance of a line item in this area?

General LAMBERSON. The Air Force is defending that line item before the Congress, yes.

Mr. RENEHAN. How critical in your view is it that it be an Air Force line item as opposed to a DOD line item. There has been some discussion of that last year.

General LAMBERSON. That is not as critical as the idea that the work get done. I cannot make that argument. But I would make the argument that I think it does belong in the Air Force. It is the Air Force

who will deploy these systems. They must be the advocates for whether these systems should be deployed. The Air Force needs to develop an understanding of what the target systems are, not the people at DARPA who are developing the technology. DARPA is not equipped to do the system concept definition or the system analysis. The Air Force or the services are equipped to do that.

So, my recommendation is that system utility matters are very, very much a responsibility of the services. In the broader context of program management between the Office of the Secretary of Defense and the services, the OSD has studied the issue at some length and has agreed that the current management arrangement, in which the services execute the programs and OSD exercises policy, direction, and review, is the appropriate management arrangement at this point in time.

Mr. RENEHAN. Thank you.

SOVIET CIVIL DEFENSE

Senator THURMOND. I am very much interested in the civil defense program. The Soviets have gone to a great extent, have they not, in providing a very adequate civil defense program; is that your understanding?

Mr. MAGUIRE. That is correct, sir.

Senator THURMOND. Now, they are not spending all that money for nothing.

Mr. MAGUIRE. That is correct, sir.

Senator THURMOND. I think it indicates their aggressive attitude and what they anticipate in the future, what their plans mean.

Mr. MAGUIRE. Senator Thurmond, our best intelligence information indicates that the Soviet Union has gone through and is going through a massive buildup in their civil defense capabilities.

We testified earlier that to the best of our knowledge the Soviet Union is spending on the order of $3 billion annually for civil defense purposes. Those numbers, the dollars associated with that, are a rough equivalency and do not include some of the industrial segments of the Soviet society which are volunteering contributions to the civil defense structure of the country.

We know, for example, that some segments of the industry are as part of the initial cost of new construction putting in blast-protected shelters in areas that the industry personnel, the key industry personnel, the management of industrial plants and key workers, can use at a time of an emergency.

We know also that there are on the order of 150,000 full-time personnel involved in the Soviet civil defense program. This is a combined military and civilian effort and our intelligence estimates indicate that with those numbers of people and that infusion of funding they do have a very, very massive program—one that is not matched in this country, I might add.

REDUCTIONS IN FISCAL YEAR 1983 CIVIL DEFENSE REQUEST

Senator THURMOND. Mr. Maguire, would you identify for the record the extent to which the reduction imposed by the Congress last year

on the President's budgetary request for the civil defense program has impinged upon your ability to perform the various tasks he has set out, that you had set for yourself?

Mr. MAGUIRE. Yes, sir. In a summary fashion, our agency has responsibility to look to four functions—prevention, mitigation, response, and recovery from emergencies.

We have had to—because of the funding level that we are at now, concentrate on the response activities. There were questions asked here this morning where we were forced to refer back to 5-, 10-, and 15-year-old surveys that we have done. We are unable to update those programs to today's standards at the level of funding we are now at. We are at a below-maintenance level in this country on our civil defense program.

Senator THURMOND. Now, General Tate, if the Congress opts to forego Dense Pack with all those MX's based in Minuteman silos, will we be able to field the ballistic missile defense system capable of protecting MX?

General TATE. Yes, sir. We can develop a capability to defend MX missiles in Minuteman silos. [Deleted] we do have the technology available that we could defend MX in widely spaced basing.

Senator THURMOND. Could you meet the MX IOC?

General TATE. [Deleted.]

Senator THURMOND. Now, there is discussion of developing a mobile small ICBM. Would a form of BMD eventually be necessary to protect such a system, or would its mobility protect it indefinitely?

General TATE. Senator, I do not believe that the small mobile missile defense systems have been studied extensively enough to give you an absolute answer on that. We are looking at defense of small missiles, including those deployed in a mobile mode. We are looking at various types of scenarios and concepts for defending them, should that be desired.

Senator THURMOND. Well, General Tate, if the Soviets were to develop and deploy a maneuvering reentry vehicle, how would this affect our current BMD development?

General TATE. Senator Thurmond [deleted].

Senator THURMOND. General Tate, which do you feel is more survivable, a hardened silo protected by a BMD overlay or a mobile ICBM?

General TATE. Senator, I think a hard answer to that would depend on a lot of specifics. I do not believe I can give you a satisfactory answer off the top of my head.

Senator THURMOND. Would you like to answer that for the record?

General TATE. Yes, sir, we can address that.

[The information follows:]

MOBILE ICBM VS. HARDENED SILO

General TATE. Since the current interest in a small, mobile ICBM is a fairly recent event, no detailed analyses have been conducted on the relative survivability of that concept and defended, hardened silos. Until such analyses have been conducted, comparing both the defended and undefended cases for mobile ICBMs and hardened silos, the question cannot be answered with any degree of certainty.

Both the Army and the Air Force will be working on comparisons of this nature once details of a mobile system have been established. The results can be furnished when completed.

Senator THURMOND. General Lamberson, in the prepared statement you stated that we can conceivably develop a forward space based laser system capable of destroying 50 percent of a large-scale ICBM attack.

Would you elaborate on this and give estimated IOC and cost?

General LAMBERSON. Sir, the system that we alluded to in making that statement would be a possible result of the space-based laser program which we have presented and are defending in the Congress.

That could be a system of a brightness that we have not yet achieved, that would be an extrapolation of the demonstration programs that are currently in progress within the program. I would like to provide for the record a better estimate of the cost and schedule to achieve the capability that we have indicated there. But it would not be [deleted].

[The information follows:]

COST AND SCHEDULE FOR SPACE-BASED LASER

The cost and schedule of a space laser weapon system deployment is highly dependent upon a number of factors, including the hardness of the potential targets, the total number of targets that must be handled, and the number and spacing of the targets in a single raid. These factors and many others must be considered before making even the most preliminary of cost estimates. The Air Force has initiated efforts to analyze these factors, and, as indicated in the DOD Space Laser program plan, to develop space laser weapon system concepts for which cost estimates can be generated.

Senator THURMOND. General Lamberson, would you discuss the possibility and applicability [deleted] lasers as compared to [deleted] lasers. Would you like to do that for the record?

General LAMBERSON. Yes, sir, we will do that for the record, but I will make a couple of statements to begin. The use of [deleted] directed energy source such as a laser or [deleted] is of course very attractive.

[Deleted.]

They do offer some potential advantages and we will elaborate on that in the record, sir.

[The information follows:]

[DELETED] LASERS

The prospect of nuclear pumped directed energy systems is based on the theory that a reasonable fraction of the energy available in a nuclear detonation can be concentrated into a [deleted] beams. [Deleted.] Conceptually, the X-ray laser would destroy its target by depositing energy at the surface of the target. This short radiation pulse creates an intense shock wave which can potentially cause massive destruction in the target. [Deleted.]

Senator THURMOND. Thank you.

General Lamberson, what sort of vulnerability would space-based laser systems have to a so-called super-electromagnetic pulse weapon?

General LAMBERSON. Sir, every weapon has its vulnerabilities and its countermeasures. The issue of whether a viable countermeasure can be taken against a space-based laser is exactly one of the areas of the Air Force portion of the space-based laser effort. We will elaborate on

that in the answer to the record. But it is by no means clear that it is very vulnerable to that kind of weapon.

[The information follows:]

VULNERABILITY OF SPACE BASED LASER SYSTEMS TO SUPER ELECTROMAGNETIC PULSE WEAPONS

Every weapon system has potential vulnerabilities and countermeasures. The impact of nuclear directed energy weapons effects will be included in our assessment of the survivability and military utility of various directed energy concepts for strategic defense application. The DOD has several programs, including the Air Force Space Based Laser Technology program, which are determining the effects of X-ray pulses and EMP on space system components. Once the vulnerability of such systems is understood, hardening concepts can be developed or deployment methods devised to reduce or eliminate the vulnerabilities of our systems to such effects.

Senator THURMOND. We have some other questions here. I have to go and vote and I will turn it over to the staff to continue. Thank you very much.

Mr. RENEHAN. General Lamberson, to follow up that question that I asked earlier about the line item in the Air Force budget, I understood your answer to say you would rather have it in the Air Force budget. If it cannot be there, you want the line item.

General LAMBERSON. Absolutely, yes.

Mr. GAFFNEY. General Lamberson, also going back to last year, the Congress expressed considerable interest in the development of short wavelength lasers as a complement to and to some extent as an alternative to longer wavelength systems now under study.

Would you give us an update on your short wavelength development efforts, any technological progress that has been made in the intervening period?

I think it would be helpful to have for the record an assessment or a calculation of what indeed that level of effort is as reflected in your funding request.

General LAMBERSON. Do you prefer that for the record, or do you want me to answer it?

Mr. GAFFNEY. It would be helpful, as I said, if you could give a few comments and you can flesh them out for the record.

General LAMBERSON. Indeed, the acceleration of short wavelength programs was, of course, made possible by the additional funding of the Congress, last year. Specifically $10 million were added to those programs.

If we look across the board at short wavelength developments in DARPA and the Air Force, and the Navy, and the Army, in fiscal 1983 we will be spending in excess of $50 million. That is all technology related to short-wave-length applications.

But the principal developments here are fourfold in number, here are two devices, two laser devices in DARPA programs, both electrically initiated. One is the EXCIMER laser [deleted]. We will expand upon that in the record.

The second is the electronic laser that has [deleted].

So, both of those lasers are looking attractive. They are still at very low power. Both do still require electrical power, they are electrical lasers and ultimately must be plugged into the wall and therefore power supplies are an issue.

For that reason, as well as others, two chemical lasers, that is lasers which are activated directly by the burning of chemical fuels as opposed to electrical energy, do look promising and are under development within the Air Force. One program is the iodine system that you referred to earlier and the other is an iodine-chlorine transfer laser system which would be very near the visible in wavelength.

So, the point is yes, there are lasers, many laser candidates at the shorter wavelength which look attractive and which are proceeding in their development. None of those have sufficient advantage right now for us to abandon the other concepts at short wavelength let alone abandon that which we clearly understand at the middle infrared or longer wavelength areas to put all our money in one short wavelength basket. There is too great a risk to be able to do that at this point, both in power scaling and the ability to get beam quality.

The other issue of short wavelength lasers that we have come to appreciate very clearly in the past year is whether the ability to make optical systems good enough to use the shorter wavelengths to advantage. We will be glad to provide the committee a calculation which indicates that unless we learn how to point and track an order of magnitude better than we now know how to do, and unless we know how to build a mirror on order of magnitude better than we now know how to do, we will not receive the advantage of the shorter wavelength which is potentially there.

So, optics and pointing are very important issues and we have used the money which the Congress provided in a balanced approach both to optics to be able to use short wavelengths and in the development of the short wavelength devices. Both are proceeding well. We have good research in those fields. But they are by no means ready to take their place as candidates in the multimegawatt region needed for weapon candidacy at this point.

Mr. GAFFNEY. I think it would be very helpful to have that additional documentation in the record.

IMPACT OF REDUCTIONS IN FISCAL YEAR 1983 CIVIL DEFENSE REQUEST

Mr. Maguire, I think it is very helpful to have the participation of you in this panel as well. One of the reasons this committee took its action last year was in part due to a difficulty in seeing how the civil defense program fit into the larger approach toward strategic defense that the administration is pursuing.

It would be helpful for us as well to have you amplify on the remarks you made in response to Senator Thurmond's question, giving as tangible an appreciation as possible of what has not happened in moving the civil defense program forward as a result of the budget reductions. That could be of use.

[The information follows:]

SHORT WAVELENGTH LASER PROGRAM

A description of the DOD's short wavelength laser program was provided to the House Armed Services Committee in a letter from the Under Secretary of Defense for Research and Engineering dated February 28, 1983. This letter provides a detailed overview of the program. A copy of that letter is provided herewith for insertion into the record.

[The letter follows:]

THE UNDER SECRETARY OF DEFENSE,
Washington, D.C., February 28, 1983.

Hon. MELVIN PRICE,
Chairman, Committee on Armed Services,
House of Representatives, Washington, D.C.

DEAR MR. CHAIRMAN: As Secretary Weinberger promised in his letter of 22 February, I am forwarding the information you requested on our Short Wavelength Laser Technology program.

In order to provide a complete picture of our total efforts in this area, I have taken the liberty to provide some information on all elements of the DOD short wavelength laser research rather than just that of DARPA. Although the DARPA effort is the largest component, it is augmented by complementary activities in the Navy and Air Force. The Navy program is a continuing effort funded at $3.5M in FY83, focussed primarily on developing laser energy sources and conducting basic research related to X-ray laser physics and solid state devices. The Air Force program is funded at $16.5M in FY83. Approximately half of this total is divided among efforts in beam control, beam path control and optical coatings and windows. The remainder is allocated to developing and understanding the science and technology associated with short wavelength devices and not being pursued elsewhere; the high efficiency oxygen-iodine chemical laser is a primary example. MGEN D. L. Lamberson, my Assistant for Directed Energy Weapons is responsible for all Defense laser weapon research and development to insure optimum allocation of resources and return for our investment.

The DARPA program is discussed in detail in the attachment and shares your committee's interest in the potential associated with short wavelength laser technology. Our enthusiasm in this area is, however, tempered by the realization that there are many known problems and difficulties, coupled with the unknowns, that must be resolved before the potential of this new technology can be exploited. Progress in 1982 was significant. The addition of $10M results in our spending over $50M in FY83 in our total DoD short wavelengths programs. I believe that our program is a well balanced and aggressive effort that is structured to permit programmatic decisions at the earliest practical time without sacrificing developments based on more mature laser technology. Specifically, we do not believe that short wavelength laser technology has yet matured to the level necessary to make decisions on prototype systems.

I appreciate your continued interest in this technology and I hope that this information satisfies your request. My Assistant for Directed Energy Weapons stands ready to discuss this matter to any depth desired.

Attachment.

DICK DELAUER.

DARPA SHORT WAVELENGTH LASER PROGRAM

The DARPA Short Wavelength Laser program is developing efficient, high power laser device and advanced beam control technology for a broad spectrum of potential military applications. These range from [deleted]. In the nearest term, technology for [deleted] excimer and free electron lasers will be developed together with the [deleted] technology required to construct large aperture beam directors fully compensated for the effects of atmospheric turbulence. These technology elements, if integrated and deployed at selected ground sites, can potentially provide a robust capability [deleted]. In the farther term, these technologies can be developed toward more stressing applications such as defense against strategic aircraft. These applications might be addressed by utilizing ultra high power short wavelength lasers on the ground coupled with space relay mirrors or by basing high efficiency free electron lasers in space.

DARPA also has responsibility for investigating the military utility of bomb driven x-ray lasers and pursuing relevant pointing technology. These efforts complement x-ray laser device development sponsored by the DOE at the Lawrence Livermore National Laboratory. Potential x-ray laser applications, identified in a joint DOD/DOE workshop held last year, [deleted].

During the past year, outstanding technical achievements have provided increased confidence that the laser device and beam control objectives of the DARPA Short Wavelength Laser Program can be reached. These achievements include: [Deleted.]

As a result of the additional $10M provided in FY 1983, we have accelerated development of these technologies. The program is now focused on making informed technical decisions in FY 1986 regarding the feasibility of nearer term [deleted] and determining the potential for more stressing, longer term space applications.

The funding levels in the FY 1984 President's Budget submission will allow continuation of these developments with the objective of providing the technology base required to initiate construction of a [deleted] excimer and a [deleted] beam director by FY [deleted]. The additional $10M in FY 1983 has accelerated the schedule for this decision by [deleted] and may thereby provide the option, [deleted] based on this technology. The additional funds will allow DARPA to initiate technology programs to develop [deleted] technology and to extend the DARPA Laser TRIAD beam control technologies to shorter wavelength operation.

The following table summarizes the allocation of the additional FY 1983 funding to the major elements of the DARPA Short Wavelength Laser program.

[In millions of dollars; fiscal year 1983]

	President's budget submission	Allocation of additional funds
Program element:		
Excimer lasers	13.3	4.6
Free electron lasers	5.0	1.8
Advanced beam control	7.4	3.1
Bomb driven X-ray lasers	.5	.5
Blue-green lasers	6.5	.....
Total	32.7	10.0

DARPA SHORT WAVELENGTH LASER PROGRAM—PROGRESS AND PLANS

Recent progress in each of the major elements of the DARPA Short Wavelength Laser program is summarized below together with a description of the program at the funding levels established by the President's Budget Submission for FY 1983. Additional FY 1983 efforts made possible as a result of technical advances achieved in 1982 and the $10M add recently provided by the Congress are also described.

EXCIMER LASERS

Theoretical projections verified in subscale experiments indicate that excimer lasers can be scaled to average power levels up to [deleted] for ground based applications. Scaling of excimer lasers to large single pulse energies was verified in 1981 [deleted]. The DARPA program is now focused on developing technologies to allow electron beam pumped excimer lasers to operate at repetition rates up [deleted] to demonstrate high average power. Many of the essential repetitive pulse technologies have already been demonstrated over the past [deleted] in subscale experiments. The single remaining high risk element is demonstrating [deleted] from a repetitive pulse device. Until recently it was believed that to attain [deleted] at these shorter wavelengths would require [deleted]. This uniformity, which has been demonstrated in subscale experiments, is achievable at the expense of large projected increases in excimer laser size and complexity and would ultimately be reflected in large costs for a high power device.

Recently, however, subscale experiments indicate that excimer laser beams with [deleted]. Basically, the optically distorted excimer laser beam produces [deleted]. This [deleted] process also allows the coherent addition of several [deleted]. This technology may allow excimer lasers to be scaled [deleted].

In FY 1983 the development of repetitive pulse technologies for excimer lasers will be continued with the objective of resolving all remaining repetitive pulse issues by the end of FY [deleted]. With additional FY 1983 funding these issues can be resolved [deleted] so that the final design of a [deleted] excimer laser can be completed by mid FY [deleted]. These funds will also allow an experiment with the existing five kilojoule single pulse excimer laser to determine the feasibility of efficiently scaling the [deleted] results to large beam energies and significantly larger apertures. If successful, these experiments will establish the feasibility of substantially [deleted]. In addition these experiments will establish the feasibility of scaling excimer lasers to [deleted].

FREE ELECTRON LASERS

Theoretical models project that free electron lasers can be scaled to multi-megawatt average power at electrical efficiencies up to 30%. These models indicate that the key to achieving high efficiency in free electron laser centers on the use of a [deleted]. During the past year single pass amplifier experiments at 10.6 microns, conducted by Los Alamos National Laboratory, have validated many of the essential features of the tapered magnetic wiggler approach. In FY 1983 this experimental work will be continued with the objective of demonstrating efficient operation of a free electron laser [deleted]. With the additional FY 1983 funding, rf accelerator technology will be extended to provide the improvement in electron beam emittance required to scale free electron lasers to shorter wavelengths. This will allow short wavelength (0.4–1 micron) free electron laser experiments to be initiated in FY [deleted] one year earlier than possible at the original funding level. The additional funding will also allow significantly accelerated development of high power free electron laser resonators and optics. The additional $2M provided for the DARPA Particle Beam Technology Program will be used to prepare for free electron laser experiment on the Advanced Test Accelerator. These experiments will demonstrate that large single pass gains are possible with high current electron beams and will resolve one of the remaining issues in scaling FELs to high average powers.

ADVANCED LASER BEAM CONTROL

Scaling laser wavelength from the infrared to shorter wavelengths in the near ultraviolet offers the potential of a factor of ten increase in lethal range for space defense applications. However, this range advantage can be realized only if beam control—mirror figure, aimpoint stabilization and atmospheric turbulence correction in the case of ground based applications—can be made more precise by a similar factor. In each of these beam control technologies, significant technical issues remain which must be resolved before the full potential of scaling to shorter wavelengths can be reached.

The nearest term application of Short Wavelength Laser Technology would utilize [deleted]. In order to realize the full advantage of scaling to shorter wavelengths, [deleted].

During 1982, however, two new concepts were identified which have the potential to [deleted]. These new concepts address the critical issue of [deleted]. These [deleted] concepts measure of the [deleted] with a wavefront sensor. This information is then used to control the surface of [deleted]. In the near term, this concept allows [deleted]. A novel extension of this approach will allow [deleted].

In FY 1983, the President's Budget Submission provided for experiments to verify the feasibility of the [deleted] approach and to develop requisite [deleted] technology. Additional funding in FY 1983 will be used to accelerate this program by one year and to provide for extension of laser Triad beam control technologies [deleted]. These efforts include initiation of component development for ultra-stable [deleted].

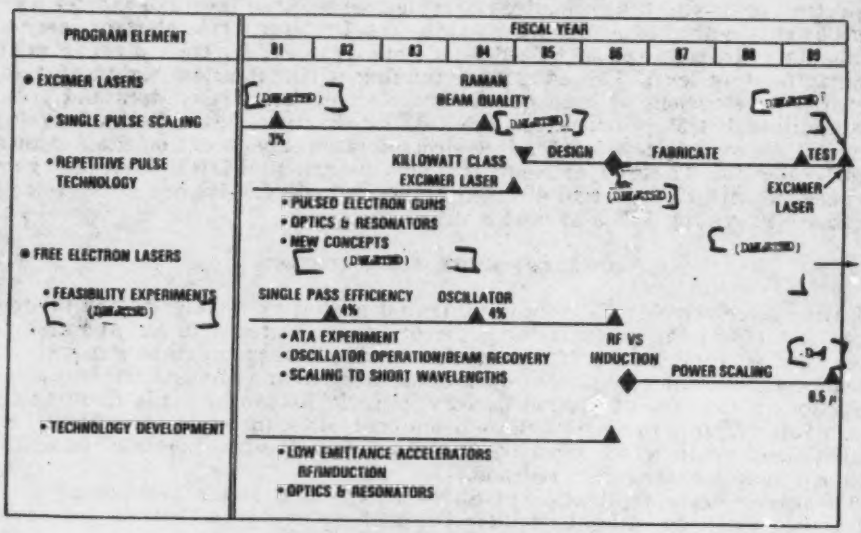
DARPA SHORT WAVELENGTH LASER PROGRAM—TECHNOLOGY DEVELOPMENT SCHEDULE

The attached charts describe the planned major milestones in the accelerated DARPA Short Wavelength Laser program. The first two of these charts provide a detailed description of the laser device (excimer and free electron lasers) and advanced beam control programs. The technology program, during the next [deleted] has been structured to determine the feasibility of constructing [deleted] short wavelength lasers and [deleted] beam directors fully compensated for the effects [deleted]. In FY 1986 major decisions can be made on whether to initiate construction of a [deleted] both of which could be available [deleted]. These decisions will be dependent on successful completion of the [deleted] feasibility experiments, successful development of scalable component technologies and an evaluation of other alternatives for achieving this capability. This program can potentially lead to a [deleted].

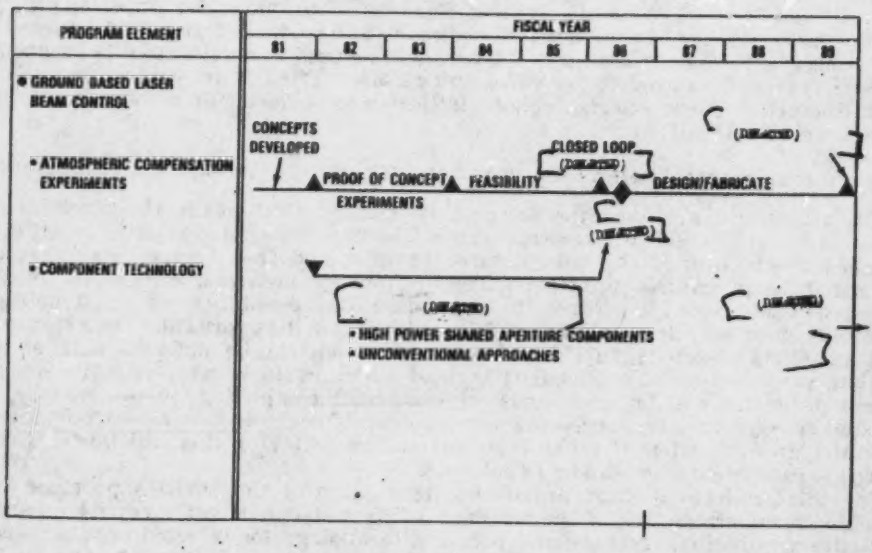
The third milestone chart provides a description of the DARPA program to develop an understanding of the military utility of bomb driven x-ray lasers and requisite acquisition, tracking and pointing technology for selected applications. The scope and pace of this program are keyed to major milestones in the DOE program [deleted].

Evaluation of the military utility of Bomb Driven X-Ray Lasers is being conducted jointly with the Military Services and the Defense Nuclear Agency. The DARPA program to develop Acquisition, Tracking and Pointing (ATP) technology for x-ray lasers has been structured to provide the technology base for initiation of an ATP brassboard [deleted]. This ATP brassboard could be tested in flight tests [deleted].

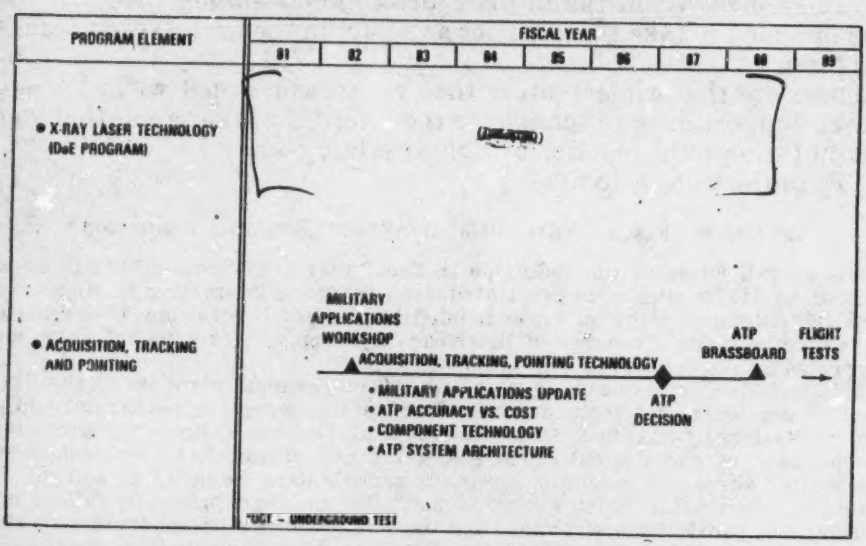
LASER DEVICE TECHNOLOGY



ADVANCED BEAM CONTROL TECHNOLOGY



APPLICATIONS ANALYSES AND ACQUISITION, TRACKING AND POINTING TECHNOLOGY



Mr. MAGUIRE. Yes, sir, I appreciate that opportunity. I would like to add that we appreciate the opportunity to participate in this panel—not only for the opportunity to describe for the committee our program but also to demonstrate that in the past year we have worked in full partnership with the Department of Defense in formulating our program.

We have held various civil-military coordination conferences throughout the country, which for us is where the program is based. Our regions, States, and local communities have civil defense planners and radiological defense officers, who are there on the frontline, as it were, in responding to emergencies of all types.

They, in conjunction with National Guard forces and local volunteer and military organizations, provide a composite of the planning and emergency capabilities for those communities.

In addition to those types of activities the civil defense program is of course a part of the overall strategic deterrent posture of this country.

Might I describe some of the other activities that are put off in our schedule for the overall civil defense program that we are now designing to meet provisions of the Civil Defense Act of 1950 and particularly the 1980 and 1981 amendments, including title V.

Our integrated emergency management system is intended to meet both the attack preparedness elements and the natural and technological disaster preparedness elements specified in title V. We have been unable to look at the hazard assessments that are required in the States and local jurisdictions. We have been unable to adequately come up to the level of staffing in the local communities and at the State offices that is required to fully do the planning and makes the preparations which are called for by title V.

That includes planning for protection of the people through movement of people out of the urban areas. We have been unable to get fully involved in the in-place protection planning program that was intended to take place earlier as a part in the overall civil defense program.

These are the primary areas that we are concerned with. I would like the opportunity to submit for the record the other areas that were put off through the inaction of Congress last year.

[The information follows:]

EFFECT OF FISCAL YEAR 1983 MONETARY REQUEST REDUCTION

The overall effect of the reduction in fiscal year 1983, from $252 million requested to $147.4 million appropriated, was to preclude starting in fiscal year 1983 the enhanced program recommended by the administration. This resulted in failure to make a number of first-year improvements that would have been supported by the fiscal year 1983 request.

This included, for example, not adding 280 professional planners at the State level, to accelerate development of local and State emergency plans; not adding 200 professionally-qualified State Radiological Defense Officers, to accelerate development of radiological defense systems and capabilities; not completing the shelter survey in reception areas, to provide data essential as a basis for planning; not marking with shelter signs 22,000 buildings providing fallout protection; not providing instructions for the public in local telephone directories, on where to go and what to do in time of emergency, in jurisdictions where plans had been developed by end—fiscal year 1982 (these communities have a total population of about 36 million); and not providing matching funds adequate to meet local and State requirements for Emergency Operating Centers, for improvement of emergency warning and communications systems, and for the maintenance of existing systems.

Unfortunately, the impact of last year's reductions goes deeper than merely delaying for yet another year the initiation of a meaningful civil defense program. The more serious impact, we feel, is manifested in continued deterioration in program capability and credibility.

Maintenance level appropriations (status quo appropriations corrected for inflation, or marginal increases) do not maintain program capabilities. Much of the civil defense capability that exists today is the result of expenditures made in the 1950's and 1960's for warning and communications systems, emergency operating centers, shelter surveys, shelter marking, procurement of radiation detection equipment, and other programs. Much of the equipment that is in use today, therefore, is 20 to 30 years old and is in want of modernization (replacement or maintenance) just to maintain current capabilities. Warning sirens are going out of service due to lack of adequate maintenance; no new shelter signs go up to replace old ones that come down due to the demolition of older buildings, vandalism, or other reasons; communications equipment at all levels (Federal, State, local) is not being replaced or repaired at a pace and level which would allow for maintenance of the status quo.

Just as serious as our inability to maintain system capability due to aging equipment is the loss of credibility the Federal program suffers in the States and localities with each year of maintenance-level funding. Much of the aging equipment referred to above is located in the States and localities, and the deterioration of this equipment and program capability is all too obvious at these levels. Capability deterioration leads to credibility deterioration, which in turn affects the amount of matching funds that is made available by State and local governments, and their commitment to the program.

Another serious impact the fiscal year 1983 budget reduction has had is in the area of industrial protection—a new program element. Given the extent of the fiscal year 1983 reduction, we could not maintain current personnel levels and commitments in other areas and at the same time provide adequate funding for a new element. The result was that the Protection of Industrial Capability program was faced with an unchanged deadline to complete the studies and analyses mandated by the 1982 National Security Decision Directive, but sharply reduced resources to perform this mission. Less sophisticated approaches than would otherwise have been used must be applied to such problems as determining

essential industries and key workers, and important research and field testing must be foregone.

The impact of the fiscal year 1983 reduction, therefore, has been more serious than delaying for one year the initiation of an enhanced program.

FEMA/DEPARTMENT OF DEFENSE COOPERATION

Mr. GAFFNEY. On that same point, I think the coordination that is under way between the Department of Defense and FEMA is sine qua non, if you will, as far as this committee is concerned, to insure that there is no mismatch between the expectations of the Department of Defense and the expectations of FEMA.

In that specific regard, if you would comment for the record, if necessary, on the degree to which your efforts to improve the civil defense communications and warning systems are benefiting from the work that is under way within the Department of Defense, C^3 upgrade and survivability and endurability efforts. Do we have some assurance that you are not passing like ships in the night, as it were, perhaps resulting in inefficiencies both in terms of the effort that is being made, and the money that is being expended in a less than fully integrated and usable system. We do recognize your different mission to the extent that EMP protection, for instance, is going forward; communication dissemination systems are being provided that are relatively resilient against kinds of attacks one must anticipate. It would be helpful that you indeed are marching in lock-step with the Department in that regard.

Mr. MAGUIRE. For the detailed response, Mr. Gaffney, I would have to submit information for the record from our telecommunications experts.

However, from an operational standpoint, through the Joint Connectivity Task Force we operate under the same warning system as the Department of Defense, as keyed by the NORAD system described this morning.

We have the civil side responsibility to provide warning throughout the country to our local communities and we key that from the NORAD signal.

As I said, I would appreciate the opportunity to submit for the record the details of our system, which is using a number of design parameters that the Department of Defense has developed.

[The information follows:]

TELECOMMUNICATIONS AND WARNINGS SYSTEMS

We believe that our relationships with the Department of Defense, in the fields of telecommunications and warning in particular, are so close and effective that they could indeed be characterized as being in "lockstep." We believe that the closeness of these relationships assures that our efforts will be efficient, and moneys will be expended to develop fully integrated and interoperable telecommunications and warning systems. Our systems will benefit fully from DOD work regarding survivability and endurance, and we expect that DOD systems will similarly benefit from FEMA's experience in telecommunications within the civil side of government.

In the area of technology transfer, it is conducive to close relationships that many of FEMA's telecommunications and warning managers and experts have worked in DOD until recently. This includes, for example, our Assistant Director for Information Resources Management (formerly with the National Communications System), the Chief of our Telecommunications Management Di-

vision (formerly with the Defense Communications Agency), as well as most members of our telecommunications and warning staff. The first two persons mentioned directed or supported DOD survivability and endurance studies relating to command, control, and communications.

Close relationships, both informal and formal, exist at all levels. For example, both FEMA and DOD personnel serve on frequency spectrum management working groups of the Interdepartmental Radio Advisory Committee (IRAC). We work closely with DCA in all areas of systems development. Thus FEMA's Direction, Control and Warning Communications System (DCWCS), with procurement starting in fiscal year 1983, will make use of the Defense Satellite Communications System.

FEMA and DOD work closely together on an organizational basis. For example, DCA is providing consultative services in the development of FEMA's Emergency Information Coordination Center (the national operations center), which will be analogous on the civil side of government to the National Military Command Center (NMCC) on the military side. There will in fact be commonality of communications and warning systems and circuits in the EICC and NMCC.

DOD provides FEMA communications and electronic support in such areas as engineering, procurement, installation, and maintenance. DOD also provides augmentation personnel for FEMA's Regional communications operations and maintenance, in the form of U.S. Army Reserve units.

Our work to improve civil defense telecommunications and warning systems benefits from work DOD has done, and we believe the reverse will be the case as well. For example, we expect that the connectivity of the nation's Emergency Broadcast System will be improved by use of the Defense Satellite Communications System, in our DCWCS program. DCWCS will also make use of National Security Agency secure communications equipments, and will interface directly with the Defense Communications System (AUTOVON, AUTODIN, and AUTOSEVOCOM).

In the area of electromagnetic pulse (EMP), one of FEMA's predecessor agencies worked very closely with the Defense Nuclear Agency and other DOD elements in EMP research and development. This included research, development of practicable countermeasures, and engineering, as well as limited application of countermeasures to protect key broadcast stations and Emergency Operating Centers against EMP effects. FEMA and DOD continue to share EMP information and design technology.

FEMA's predecessor agency pioneered the use of EMP-hardened low frequency (LF) radio for warning. Based on these efforts, the Air Force is now beginning development of its Ground Wave Emergency Network (GWEN).

Our DCWCS program will also include the use of meteor-burst warning and communications services, as backup to other warning systems. The Air Force has expressed interest in our providing knowledge and experience we gain in deploying and operating this system.

Finally, FEMA and DOD participate in the same exercises several times annually. These provide for testing systems and procedures, for joint training, and for identifying areas needing improvement.

In short, as I stated in my testimony on March 23, 1983, FEMA works in full partnership with DOD in formulating the civil defense program, and this partnership is specially close in the area of telecommunications and warning.

Mr. GAFFNEY. Thank you.

General Tate, if I might turn to your part of this program briefly. We have discussed earlier this morning in a couple of different contexts the impact of the ABM Treaty limitations on some of the options that might otherwise be available to us with respect to defending, in particular, ICBM systems, but possibly other high-value assets.

Recognizing that you are not responsible for the administration's arms control policy, you are nonetheless uniquely qualified, I think, to provide a net assessment of our ballistic missile defense capabilities as they relate, among other things, to an ability to rapidly put into place a competent ballistic missile defense system versus those of the Soviet Union. It would be helpful to us to have an appreciation of whether or not it is your personal judgment that movement by

this country at this time that put in train or at least would be perceived as putting in train the ultimate abrogation of the ABM Treaty is in our national interest.

General TATE. Well, I can assure you at the moment, Mr. Gaffney, that we are not doing anything in the R&D program that is not in full compliance with the treaty.

The programs that we have been working on for the past several years have in some cases involved components which, in order to be fully tested, would not be in full compliance with the treaty, for example the mobile radar that was shown on the slide earlier.

For certain types of systems or modes for basing systems, the basing mode does influence whether or not it is possible to come up with an effective defense within the confines of the treaty.

As I indicated earlier, one of the things that is attractive about closely spaced basing is the fact that it uses such a small amount of real estate that it is possible to have a fairly vigorous defense with a pretty limited amount of hardware, including the 100 interceptors.

[Deleted.]

As to whether it is in the national interest, to set into motion events which might ultimately lead to the abrogation of the treaty, did you also intend to include there a modification of the treaty? I am not sure what your intent was.

Mr. GAFFNEY. Well, that is a gray area, I believe. The extent to which any alteration of the treaty would in effect lead to a situation where the other side would simply say:

> Well, if I do not agree to modifying the treaty you are going to violate the treaty, ergo, the actions that you are taking are going to put me in the position of either forcing me to modify the treaty or anticipate its ultimate, if not immediate violation.

As you well know, that has certain political repercussions in this environment such that the distinction between the two is not always terribly clearly defined.

Mr. GARDNER. I would like to comment on that, if I might. I believe that it is clear that it is possible for the United States to proceed to develop and deploy an ABM system for the defense of their ICBM forces that can be effective and still satisfy the compliance of the ABM Treaty. The notion that such a deployment would be an initial step toward the abrogation of the ABM Treaty I do not think is warranted.

If you were to argue that such a step were warranted, then you would certainly have to be concerned at this stage in the game about the Soviet Union abrogating the treaty since they have developed and deployed such an ABM system within the confines of the treaty and they are now in the process of upgrading it.

So, it is clear, or it at least appears to be clear that the Soviet Union, looking at their value structure, concluded that it was in their best interest to develop and deploy and continue to operate an ABM system in the defense of what they apparently feel is most important to them.

It would appear that we should be able to do the same thing also without necessarily that being an initial step toward the abrogation of the treaty.

Mr. GAFFNEY. Your point is well taken. I think in a vacuum the logic is flawless. Unfortunately we are not operating in a vacuum and unlike the Soviet Union which can make a decision to spend *x*

billions of dollars developing and deploying a system which if they were held accountable to congressional testimony they would have to say, "It is not going to work, it is not going to defend the Soviet Union. It is not even going to defend the Moscow area that it is designed to defend beyond a certain point." It will draw down, obviously, to some extent incoming warheads but ultimately there is very little doubt, as the Senators would tell you if you were to present this as a program here, that ultimately it would be saturated and the target would be destroyed.

So, when we look at the testimony that has been provided this morning by yourself and by General Tate concerning what would be required to provide some measure of efficacy in your defensive system such that, "Senator, it is worth spending x billions of dollars for this because it will provide a realistic, credible defense of whatever high-value target you may be thinking to defend"—presumably the ICBM field, you find yourself in a situation where, "Senator, it costs us x billions of dollars because we are going to deploy 500 interceptors in order to make that an efficacious system."

So, the vacuum side in this political environment, I think, if one were to say to Members of the Senate, "We need to deploy a system to defend our ICBM's, the first stage of which can be deployed without violating the ABM Treaty, but on the other hand, it does not do the job," you very quickly find yourself in the situation that I think those of us who have been following this for some time appreciate we are in, which is the "chicken and egg" model.

Mr. GARDNER. If I might, I would like to comment on that. It turns out that we believe that it is possible that militarily effective defense of our ICBM forces, in particular the Peacekeeper missile, is possible within the treaty and that it does not have to lead to an expansion of or abrogation of the treaty. The thing that has made that possible are the technological advances on hardening of ICBM silos that occurred over the last several years.

If you think about the effectiveness and leverage of a defended force, that leverage, if you will, or the price that it can charage when it is under attack, can be a set of multiplying factors that multiply together for the ultimate effectiveness of the system.

For example, if you change the hardness of the ICBM silos from where they are now—say at Minuteman levels—and increases that hardness to the levels that are now being considered for Peacekeeper, that represents a leverage on the part of the defended forces and in the defended forces' favor that is a factor of [deleted].

You can then, with a defense system, expand that leverage again by a factor of [deleted] with 100 interceptors. If you then take, for instance, a 100-MX force and provide additional aim points, you can provide an additional factor, leverage factors, that represents the product of a number of silos beyond that that you have MX missiles to put in them.

So, you can end up with leverage factors that are products of [deleted] times [deleted] times [deleted], for example, factors of 30 or more on the leverage of the defendant force from that that is available when you attempt to defend Minuteman.

Mr. GAFFNEY. But a factor that you did not mention that General Tate did [deleted].

Mr. GARDNER. [Deleted.]

Mr. GAFFNEY. So, just to clarify the point, if one were to submit that superhardening of Minuteman shelters—assuming that is technically feasible—[deleted] is it your testimony that some number of missiles, interceptor missiles, in excess of the 100-interceptor limit, would be required to provide a meaningful defense of MX missiles?

I believe that is what your chart showed.

Mr. GARDNER. That particular case has not been examined in detail, but it is likely that it would require more missiles than in the case that I described. [Deleted.] As my chart indicated, there is a trade between the number of missiles required and the number of silos and their hardness.

That full matrix of alternatives has not been examined in detail. We are attempting to get a better understanding of that matrix but we do not have it completed at this time.

Mr. GAFFNEY. General Tate, your command has not done those analyses either?

General TATE. Which one is that, Mr. Gaffney?

Mr. GAFFNEY. The analyses of the matrix that Mr. Gardner has just talked about, which tries to play off variations [deleted] hardness and interception to get an appreciation.

General TATE. I do not believe we have it available in a matrix form, we have not done that. We have done a lot of studies of the individual pieces.

Mr. GAFFNEY. If you go back over this record and you see some additional testimony that would be relevant at that point, you might submit it.

[No additional information at this time.]

General TATE. I would like to comment on your question. One is, your question seems to imply that perhaps we should not continue to spend money on the large R&D program because of a fear of ultimate abrogation of the treaty.

My comment there would be that if we do not do the R&D—and it requires a fairly vigorous program to do it at a reasonable rate—we are never going to have any options for the ultimate deployment of capable systems that can deal with the various threats, particularly those that we see coming or that may be coming in the outyears.

Second the ABM Treaty was signed, as was mentioned previously here this morning, with the idea that there was also going to be corresponding limitation on the offensive missiles. That has not occurred.

It brings up the question, are we forever going to find it in our national interest to observe the ABM Treaty, regardless of what the Soviets do in terms of their strategic offensive weapons—the numbers, quality, and so forth?

Another factor is that we cannot be assured that the Soviets are not going to just abrogate the treaty and deploy BMD systems other than the one around Moscow, and in numbers that are not currently allowed by the treaty.

If we have not done our R&D homework, we are not going to be prepared to respond. It may be very much in our national interest, in fact absolutely essential, that we respond in such a circumstance. All of this seems to me to very strongly support a big, strong, vigorous R&D program that is fairly broad based since we cannot predict the

future. That is: looking at endoatmosphere systems, exoatmospheric systems, looking at nuclear systems, nonnuclear systems, and developing all of the sensors that are required to be able to bring out as much capability from our technology as is possible.

Mr. GAFFNEY. I think that is helpful. I have two follow-up questions to that, but I will defer to my colleague.

Mr. RENEHAN. I have one follow-up question to Mr. Gardner. I think I understood what you said, that you are talking about a system which essentially has [deleted] is that correct or did I make a bad assumption?

Mr. GARDNER. I think that is essentially correct. The one that takes advantage [deleted] and is willing then to look at the relationship between the number of silos and the number of interceptors required to get the desired end.

Mr. RENEHAN. To pick up on just one line of questioning earlier, the problem with perception. Do we have in this case a requirement in any way for a modification of the ABM Treaty to move away from Grand Forks? That would have to be agreed to by both sides?

Mr. GARDNER. I am not an expert in arms control issues. So, certainly that question should be answered and responded to by those that are involved in this issue.

[Deleted.]

Mr. RENEHAN. [Deleted.]

Mr. GARDNER. That is correct.

Mr. GAFFNEY. Two points to follow up the General's comment. One, would you give us your assessmenet of the SA–X–12 missile now under development in the Soviet Union, a mobile system credited, as I understand it, with some capability [deleted] and particularly in the context of how you assess the potential of that system to be netted into a treaty, legitimized, if you will, ABM system in the Soviet Union in such a way as to provide effectively a rather rapid break-out capability and a militarily useful ballistic missile defense capability?

General TATE. Well, Mr. Gaffney, I do not know if you have heard the briefing prepared by the Missile Intelligence Agency at Redstone Arsenal or not. If you have not, I would suggest that you do so.

The information that we now have available on the SA–X–12 [deleted].

[Deleted.]

Mr. GAFFNEY. But it is worrisome.

General TATE. It is very worrisome.

It gets back to the same thing I believe I discussed with you some months ago. that it is of concern to us that when the 1976 de-emphasis on the BMD program was fully implemented, after the Safeguard system was deactivated, we spent very little money. The Soviets spent a lot. [Deleted.] They have their industry-military teams; they have the production lines; they have the training base.

Because of the fact that they have a deployed system and are continuing to develop not only BMD systems [deleted], they are making a lot of progress in this area. This has allowed them to do a lot in catching up with us on technology. We were miles ahead of them 10 years ago. Today we are still ahead of them in certain aspects but there

are other aspects, particularly related to deployment in which they obviously have a lead on us at this time. That is very worrisome.

It is only going to be with a vigorous program such as I discussed before, leading to prototypes and actual testing that we are going to be able to maintain our technology in the kind of a state that we could use it in some reasonable period of time if we are called upon for deployment.

Mr. GAFFNEY. When do you expect that SA–X–12 will be introduced in numbers as an operational system?

General TATE. I do not believe I am familiar with that specific IOC.

Mr. GAFFNEY. You can provide that for the record.

General TATE. We can provide that for the record, but it is, I believe, [deleted].

[The information follows:]

SA–X–12

General TATE. The intelligence community estimates that the basic SA–X–12 system might achieve an initial operational capability (IOC) in the [deleted].

Mr. RENEHAN. General Tate, you said we have been in full compliance with the ABM Treaty. The President's budget is $538 million and then $1.4 billion for 1985. Will all of that money still be spent in programs in compliance with the treaty?

General TATE. Yes.

Mr. RENEHAN. Thank you.

Mr. GAFFNEY. General Brown, I would like to follow up on two lines of questioning from earlier this morning. One is coming back to the air defense upgrade program. As you are doubtless aware, the General Accounting Office has found cause for recommending that perhaps some serious rethinking be done about the over-the-horizon radar system. Clearly, there is skepticism in Congress as well as elsewhere about the underlying premises that are involved behind the investment in upgrading our air defense capability that is being proposed.

In particular in the GAO report—I do not know if you have had a chance to look at it or not—the Defense Intelligence Agency is cited as having assigned [deleted] against the Continental United States, at least in the near term. They hedged their bets a little bit in the outyears.

I wonder if you might in this classified session go back over the ground that we covered in open session as to the sort of philosophy here, the degree to which this is really designed to counter a fairly improbable threat or whether it is in fact looking forward to a much more capable threat down the road.

General BROWN. Again, on the probability question my first reaction is to ask "How probable is SIOP/RISOP?" It is the least likely thing we have in our library of war plans but it also happens to be the most important.

The thing that is missing from the DIA analysis in my view is a risk-benefit analysis. They make what appears to me to be an obsolute judgment. My response is, how much benefit do the Soviets have to see in such a tactic before it becomes attractive to them.

I have discussed this with DIA analysts [deleted]. The evidence they offer is that it is contrary to Soviet doctrine, they do not see any evidence of [deleted] arguments like that. My response to that is, if you

follow that logic to its ultimate conclusion, Jimmy Doolittle would not have conducted the raid on Tokyo.

To say it is inconsistent with Soviet doctrine is to talk second order. The first order in Soviet doctrine is to understand and utilize the military value of surprise.

My view is that analysis clearly indicates that the benefit that the Soviets could derive from a successful conduct of such an attack clearly outweighs the price they pay if they are unsuccessful.

Now, no one is going to suggest that if the Soviets just don't have anything to do on a Sunday afternoon they are going to conduct a precursor bomber attack. But if you create a crisis scenario where the Soviets have decided that they are going to have to go to war—for whatever reason—if I were a Soviet planner and somebody said, "Look at the benefit of this compared to the risk we run of being unsuccessful," it just defies logic not to try it.

The thing that worries me about that is if they do try it and they are successful, then we pay a very high price by any measure of merit in the SIOP/RISOP exchange that was referenced earlier. Whether it is surviving RV's, whether it is military damage expectancy, whatever the measure of merit is, the benefit, payoff to the Soviets for a successful attack far, far outweighs the price they pay if they are unsuccessful.

You have heard the classic argument, you cannot predicate your plans on your enemy's intent, you have to worry about capability. Deterrence is in fact imbalanced if we worry so much—as we do—about providing ballistic missiles warning to insure the survivability of strategic forces under all circumstances and then ignore one that is clearly there for the taking.

As I said, I have sat on both sides of that fence and I will assure you, you give our air defense network to a SAC planner today and he will have a penetration plan back for you this afternoon because it is not difficult to do.

TARGETS IN A SURPRISE ATTACK

Mr. GAFFNEY. Well, to follow that up, can you give us a sense of what kinds of targets would be the logical ones for such an attack? The argument is made that the Soviet tanker force is so small and primitive that it would be unable to support a significant attack on the United States.

Perhaps you want to amplify on this for the record, the degree to which third country recovery or the very long legs of theirs, albeit ancient bomber force, factor into that. It is not quite clear to me. Perhaps you can comment on it, what they would be going after, what kind of force would be required to do the job and does that seem to be a capability that is within their grasp at this time, let alone when Blackjack comes on.

General BROWN. Because we carry such a large percentage [deleted] in the bomber force, it is a very atttractive target to catch on the ground.

If I were a Soviet planner I would go for the [deleted] and [deleted] critical C^3 nodes that would hopefully introduce enough confusion into the transattack phase that it might degrade the retaliatory strike. [Deleted.]

I do not need very many. We talk in terms of [deleted] at a maximum. What does it take to get all the [deleted] of the C^3? Not very much.

One of the reasons OTH–B is going to work is that you have to have very close control over time on target with such an attack, which would be relatively easy to do today. You are reasonably confident you are not going to be detected and you take advantage of night and bad weather. You can probably control time over target well within sufficient limits.

The thing that makes OTH–B work today is not change in radar technology, but advances in signal processing and computer technology. One of the things you can tell OTH–B to do is to look for a pattern of unknowns, one that might provide simultaneous time over target. There is perhaps another factor that is worth mentioning. The conventional wisdom is that when there is an unknown out over the Atlantic Ocean we know that it is an unknown—we do not, and that is one of the things that we are going to have to learn to cope with in OTH–B. In air defense we identify unknowns by ringing North America with an air defense identification zone and then requiring anybody who is going to penetrate that to file a flight plan and then adhere to that flight plan.

It is not until they penetrate the ADIZ or deviate from those procedures that we discover that they are unknown. One does not know that an aircraft is an unknown when it is transiting from Copenhagen to Jamaica.

But what you can do in the raid recognition process in OTH–B is to look for patterns such as the one that would produce anything approaching simultaneous time on targets on a critical target set. And if anything should develop, it can ring a bell and people can get involved and take a look at it.

So, if you look at the Soviet's capability to conduct that attack today, the benefit that they derive if they are successful, compared to the penalty they pay if they are unsuccessful, it is by any standard you care to name, [deleted].

Mr. GAFFNEY. Others—and for this to be answered in any detail may involve higher level classification than we are at at this point—but others in the community have indicated that they felt not only were all of the aforementioned probabilities going against the Soviets ever undertaking such an attack, but that other sources of intelligence information would be a sure-fire trigger against the eventuality that the Soviets are actually exercising and moving into a posture to attack the Continental United States with such aircraft.

If you want to handle that in some other way than responding at this time, we will appreciate it. But there is this idea that you do not need the radars because we are going to figure it out if something is up through other sources.

General BROWN. I would like to expand on that for the record but my immediate reaction is that I have heard that argument for years and years from the intelligence community [deleted]. I have not heard that very much from them since then.

In 1941 it took the form of, "They will never attack on Sunday, Admiral." And then try to find the guy who said that on the 8th of December.

So, it makes infinitely more sense to me to deprive them of the option by introducing sufficient uncertainty into that equation that they will not be tempted to try it. I think we can do that at reasonable cost. I would much rather place the security of this country in that basket than the basket of their intent.

[Additional information follows:]

INTELLIGENCE WARNING OF AIR ATTACK AGAINST NORTH AMERICA

The 1983 CANUS threat estimate, a bilateral DIA-Canadian Intelligence Estimate, states: [Deleted.]

Mr. GAFFNEY. Understood. One final question along that line. There have been press reports that indicate that the Soviet military power booklet that was presented by the Department of Defense in the past few weeks appears to reduce dramatically the number of Soviet air defense dedicated interceptors. Again, would you respond for the record if necessary, this probably being somewhat out of your bailiwick, so that we have a complete record. Has in fact the air defense threat changed dramatically and in our favor as might be the conclusion drawn from reading the military power.

General BROWN. I will be happy to submit that for the record. But I am confident that that derives principally from the reorganization of Soviet forces in the Soviet Union. The airplanes are still there. They also now have theater responsibility as well as strategic.

[Additional information follows:]

AIR DEFENSE THREAT

The numbers listed for dedicated strategic interceptors in Soviet Military Power can be misleading. In 1978 the Soviets began a major reorganization of their air forces. [Deleted.]

Mr. GAFFNEY. I appreciate very much the indulgence of the witnesses for their time. I have one final line of questioning for General Brown. I think General Lamberson might be involved in it. Mr. Gardner, if you want to stay. I would not want to hold the other witnesses any further if they are pressed to be elsewhere. Thank you.

The final line of questioning is on the ASAT capability that also had the dubious distinction of being criticized by the General Accounting Office on the grounds that its costs are greatly in excess of what had been expected; that the capabilities are limited, and that the overall requirement is far in excess of the capabilities the system would provide.

ASAT CAPABILITY

Recognizing that we have at least addressed some of these points in open session, I would like to make sure that the record is as complete as possible here.

Specifically, General Brown, if you could give us an idea—and you can elaborate on this for the record as well—on the nature and magnitude of the targets currently deployed by the Soviet Union that would

be targets for this system, versus those which would be outside the range of this first-generation weapon.

To put it another way, recognizing that it does not have the range to attack geo-synchronous satellites, how important is the fact that it does not have that capability and how important would it be, or is it for us to acquire that capability as soon as possible?

General BROWN. I would like to respond first in a general way that that testifies to the reason behind the creation of new Air Force Space Command.

One of the principal concerns of military commanders today has been that what we have done in space to date has been largely the product of research and development and, while there is nothing wrong with that, you get what you pay for.

We have been proceeding on an R&D basis and we have been getting elegant R&D systems. The problem for the military commander is that he has found himself more and more dependent on these systems only to discover that they may not be there when he needs them.

So, one of the principal roles of the Air Force Space Command and eventually, if it should ever mature into a specified or unified command, the same for the CINC's is to introduce more operational planning into what has essentially been an R&D activity in the past. I think you will get no argument on this from anyone in either the R&D or the operational world.

Admittedly, the F–15 air-launched ASAT is a system that will have a limited capability. It will, however, do a reasonably good job [deleted].

However, there are some things about the F–15 that do give you an advantage, in my view, an operational advantage well worth pursuing. One of the problems with a land-based system, a fixed-launch site system, is that you have to wait for the laws of physics to solve your problem for you. You cannot choose the time and place of the intercept. With the F–15 you do have at least a modest capability to do that.

So, I think there are some aspects of it that the critics tend to overlook. And from the viewpoint of the operational commander the alternative is really unattractive. That is, if the Soviets have the ability to deny us access to space and to protect it for themselves and provide a sanctuary, that has got to produce a major adverse military effect.

[Additional information follows:]

IMPORTANCE OF [DELETED] ASAT/POSSIBLE ASAT TARGETS

The capability to attack Soviet satellites [deleted] is important. A Statement of Need (ADCOM SON 3–79, dated 30 Nov 1979) was formalized to specifically address this issue. With the increasing use of space assets by the Soviets, this SON has increased importance. In recognition of this threat, a [deleted] ASAT program should be initiated.

The following Soviet satellites would be targets for the first-generation miniature vehicle system [deleted].

Type	Operational date	Quantity (resident/ replacement)
[Deleted.]		

Mr. GAFFNEY. All right. Let me just ask one further question of General Lamberson in this same vein. What is the earliest availability that you could envision for deploying an operational system, albeit of perhaps somewhat limited capability, utilizing high energy lasers that would have, perhaps through an airborne basing system, some of the same advantages of the F-15 ASAT but the capability to attack [deleted] targets?

A subset to that question, is some modification to the ALL an option in this regard?

We will have some additional questions for the record.

General?

General LAMBERSON. Let me answer that question in general terms. There were several questions included there. [Deleted.]

The GAO recommendation that a comparison study be performed before the Secretary of Defense approves production would seem to me to be quite reasonable. The confusion occurs, I think, in some of the growth parameters. and in the costs given to the direct vehicle systems, but I see the systems being very complementary.

Mr. GAFFNEY. Gentlemen, thank you very much.

Mr. GARDNER. We appreciate the opportunity to be here with you at this time.

Mr. GAFFNEY. Thank you.

[Questions submitted for the hearing record follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN WARNER

HIGH FRONTIER C³

Senator WARNER. Do significant technology issues arise, in your opinion, with the command and control arrangements proposed with the High Frontier concept?

Mr. GARDNER. There is no question there are several significant technical issues associated with the command and control arrangements proposed with the High Frontier concept, and these are now being carefully evaluated. The primary problem centers on timing for effective command and control. The technical challenge involves detecting the enemy ICBMs as they are launched (either in booster burn or in post-boost vehicle burn), tracking them accurately for threat assessment, and then initiating system release for weapon kill. In the case of a simultaneous launch of ICBMs and SLBMs, this would be a most difficult technical feat with anything less than a completely automated concept. This lack of a flexibility is of considerable concern, and we are looking at an array of other technical options that may offer more promise in the area of command and control.

Senator WARNER. What about operational considerations? How would "release authority" be effected?

Mr. GARDNER. There are several technical issues involved with the High Frontier proposal which are now being carefully evaluated. One, in particular, is the inherent problem of release authority. Because of the very slim time margins available with this kind of defensive approach, a preliminary analysis indicates that some sort of on-board weapon system release with command override will be required. Thus, the attack decision would have to be made in space perhaps in response to predefined release criteria. Since there may not be time for a "man-in-the-loop", we consider this aspetc of High Frontier a technical issue that must be evaluated further.

INEFFICIENCIES RESULTING FROM EXCESSIVE GROWTH IN CIVIL DEFENSE BUDGET

Senator WARNER. Mr. Maguire, as you are well aware, considerable concern has been expressed in the Congress about the rate of growth experienced in the defense budget. Some have argued that this growth rate, which has ranged under

the Reagan administration from 10 to 14 percent real growth, cannot be efficiently managed or absorbed.

How do you answer a comparable charge being leveled at your agency for which is proposed a vastly larger level of real growth in fiscal year 1984 over the level approved by the Congress in fiscal year 1983?

Mr. MAGUIRE. We have been prepared to start deployment of an accelerated program for several years, and would have been fully capable of deploying the fiscal year 1983 program at the $252 million level requested, had it been approved by the Congress.

Analysis of the fiscal year 1984 request on an item-by-item basis reveals that we propose to accelerate activities in many areas where there is an existing personnel base and substantial program experience, as well as prior research and field development. There will be no problem, for example, in increasing the number of professional planners at State level, thereby accelerating the rate of planning, because there are some 205 planners currently on board in the States who are knowledgeable of their States and of the planning techniques involved. The same applies to accelerating the shelter survey, where the technology has long since been developed, and surveys in reception areas were in fact 68 percent completed as of end-fiscal year 1982. The same is true as well with regard to Radiological Defense officers, where one RDO is now on board in each State. The problem in these and similar areas is basically one of providing the additional resources needed to get the job done.

In other areas, the increases requested would go towards meeting existing State and local requirements for matching funds. This is true, for example, of matching funds for emergency operating centers, where we are requesting $17.4 million in fiscal year 1984 as compared to a total requirement estimated by the States of $31.7 million (plus a backlog of some $8.5 million to complete projects begun in fiscal years 1981–1982, and to be started in fiscal year 1983). There are substantial unmet requirements as well in matching funds for developing State and local emergency warning and communications systems, and for the repair and maintenance of existing systems.

In some areas, our fiscal year 1984 request provides for initial deployment of systems (e.g., modern, survivable telecommunications and warning) whereas our fiscal year 1983 request did not make such a request—because we were not ready a year ago to commence deployment. In still other areas, our fiscal year 1984 request provides for development to put us in position to make effective use of procurement funds some years from now. Thus the fiscal year 1984 request for shelter stocks and ventilation devices will commence a program for engineering development, pilot production, and field trial which, pursued beyond fiscal year 1984, will put us in position to undertake cost-effective procurement in the 1987–1988 period.

The basic fact is that the civil defense program has been starved of funds for the past decade and more, and there will be no problem in efficient and orderly acceleration of the current less than austere program. Indeed, a larger sum than the $253.5 million requested for fiscal year 1984 could be applied effectively. We further anticipate that our new Integrated Emergency Management System (IEMS) deployment strategy will enhance State and local commitment to the program.

ABM COMMAND AND CONTROL

Senator WARNER. Would you discuss technical developments that give you confidence that an effective and survivable command and control system could be developed for a BMD deployment to defend a closely spaced basing on MX or some variation thereon? (e.g., Airborne Optical Sensor Systems and Command and Control Aircraft).

General TATE. The effectiveness and survivability of the BMD Command and Control (C^2) subsystem relies principally [deleted].

Some examples of the technology planned to be employed are: [deleted.]

The primary communications medium [deleted].

Airborne optical sensors and command and control aircraft are designed to perform their mission functions from any point within a large operating area (tens of thousands of square miles) [deleted].

STATUS OF KWAJALEIN MISSILE RANGE NEGOTIATIONS

Senator WARNER. General Tate, would you provide the committee for the record with a status report on negotiations with the Kwajalein Islanders con-

cerning unimpeded access of the United States to this important missile range complex?

General TATE. Negotiations between the United States Government (USG) and the Government of the Republic of the Marshall Islands (RMI) began 4 Oct. 82. On 18 Oct 82, the negotiations were concluded. A new Interim Use Agreement (IUA) covering three years (1 Oct 82 to 30 Sept 85) or until the Compact of Free Association is ratified, whichever occurs earlier, was negotiated. Key Kwajalein Atoll landowner representatives took part in the negotiation of this agreement, and the landowners have subscribed to its terms under separate arrangements with the Government of the Republic of the Marshall Islands. These documents represent an amicable settlement of all outstanding matters between the USG and the RMI with respect to the Kwajalein Missile Range.

RESULTS OF FIRST TEST FLIGHT OF THE HOMING OVERLAY EXPERIMENT

Senator WARNER. General Tate, [deleted].

General TATE. The first Homing Overlay Experiment (HOE) flight test was conducted on February 7, 1983. [Deleted.]

LIMITATION OF NONNUCLEAR KILL ABM UNDER TREATY

Senator WARNER. General Tate, in your opinion, is there reason to believe nonnuclear kill ABM systems would not be limited by the terms of the ABM treaty? Is that true for both ground-based and space-based systems?

General TATE. The ABM Treaty does not make any distinction between nonnuclear BMD systems employing radars, interceptors and interceptor launchers. However, an initialed agreement requires that if BMD systems employing components based on new physical principles and capable of substituting for radars, interceptors or interceptor launchers are created in the future, specific limitations on their deployment will be discussed in the Standing Consultative Commission.

RELEASE AUTHORITY FOR NUCLEAR BMD

Senator WARNER. General Tate, would you describe for the subcommittee the manner in which you would anticipate release authority would be secured in the event of an attack on the continental United States for such nuclear ballistic missile defense systems as might be deployed in support of a future MX deployment?

General TATE. Nuclear release for any nuclear capable BMD system deployed in the future probably would be very similar to the methods currently employed for other defensive systems and may include some of the techniques used with Safeguard in the 1970s. Timely release is a problem that has been suitably resolved for these systems and no additional challenges are anticipated with a future BMD deployment.

SOVIET CHARGED PARTICLE BEAM TECHNOLOGY EFFORTS

Senator WARNER. General Lamberson, what is the intelligence community's assessment of the Soviet Union's ability to develop and deploy a charged particle beam system with weapons application? How soon could such a deployment take place? What evidence is there that they are solving technology issues that have, as of yet, confounded American scientists?

General LAMBERSON. The Soviet Union has a substantial number of physicists and engineers clearly capable of attacking the problem of developing particle beam weapons. [Deleted.]

LIMITATIONS OF PARTICLE BEAM WEAPONRY

Senator WARNER. Is it your opinion that the prospects for fielding a militarily-useful charged particle beam weapon are limited either due to technical difficulties which must be overcome, or the limited utility of such systems for militarily-significant missions, or both?

General LAMBERSON. Charged particle beam technologgy is immature and the theory is not sufficiently well understood to predict with certainty whether a charged particle beam can be made to propagate stably and predictably through the atmosphere to a target. Such a beam will certainly require a combination of greater particle energy and beam current than is produced by today's accelerators. The advanced test accelerator (ATA) at the Lawrence Livermore Na-

tional Laboratory will provide us with experimental data sufficient to resolve the propagation issues, in terms of present mathematical models. However, it will not have the performance parameters necessary to propagate a beam to a militarily significant range. That will have to come from a device with even greater performance capabilities.

The military utility of a charged particle beam weapon will clearly depend on the technical performance parameters we are ultimately able to achieve. The particle beam offers a potential significant advantage over the high energy laser because the particle beam will penetrate immediately to the interior of a target rather than having to burn its way in from the surface. Hence it has the potential for killing the target more rapidly.

Charged particle beams may only be used in the earth's atmosphere. For a weapon based in space, a neutral particle beam is required. While many elements of the technology are common, there are significant differences.

COMMAND AND CONTROL OF SPACE-BASED LASER SYSTEMS

Senator WARNER. Is your office charged with the responsibility of insuring that, as technology development efforts proceed on space-based laser systems, that the supporting components (e.g. surveillance and warning, command and control, etc.) are also receiving adequate funding and are moving along at a pace consistent with the IOC envisioned for such a laser capability?

General LAMBERSON. Yes. The efforts to define the space-based laser weapon system concepts and the supporting component performance characteristics are funded in the Air Force's Space Laser Technology line, which was zeroed in the authorization bill last year. The failure to provide these funds has caused a slip of the fiscal year 1987 milestone date to 1988 for a decision whether to commit to weapon development.

ANTILASER HARDENING OF SPACE SYSTEMS

Senator WARNER. General Lamberson, from your perspective, given your knowledge of laser technologies and potentials, how high a priority do you believe should be attached to the hardening of U.S. space assets to laser attack? What appear to be reasonable levels of hardness given the projected Soviet threat?

General LAMBERSON. We have already begun taking steps to protect the primary sensors on some of our satellites against ground based lasers. The NAVSTAR GPS, for which a production contract has recently been signed, will be hardened against laser radiation, and so will MILSTAR, which is beginning the full scale engineering development phase. The level of hardening required depends on the brightness (a combination of power output, transmitter diameter, beam quality, and pointing stability) of the attacking laser weapon and the distance between the attacker and the targeted U.S. satellite. For example, we do not see a ground based laser as a threat to a U.S. geosynchronous satellite in the foreseeable future. However, a space-based laser ASAT could be a threat if it were to maneuver sufficiently close to that same U.S. satellite in geosynchronous orbit.

We have a technology program called Satellite Materials Hardening (SMATH) which is continuing to develop materials which will withstand higher levels of laser radiation to stay ahead of the threat. Ultimately, we will probably have to use a combination of countermeasures such as maneuvering, shielding, hardened materials, and spoofing of the adversary's acquisition, tracking and pointing system to defeat the threat.

STATUS OF HARDENING STUDIES

Senator WARNER. General Lamberson, what is the status of efforts to assess the degree to which other targets of interest (e.g. bombers, missile systems, etc.) are inherently resilient to laser attack? Where do we stand in terms of efforts to determine how such systems can be made harder to such attack?

General LAMBERSON. The DOD, following the Space Laser program plan submitted to Congress in June 1982, is pursuing a vigorous program of determining the vulnerability of potential targets to high energy laser radiation and of identifying hardening countermeasures which might be employed to resist such radiation. Our plan is to [deleted].

In the meantime, we have a vigorous materials research program in the Defense Advanced Research Projects Agency and the Services to identify materials

which could possibly be used to harden these targets and how the materials might be integrated with targets to protect them. We will then [deleted]. Our objective is to build a data base and a mathematical model which will allow predictions of laser radiation effects over a wide range of incident radiation energy on unhardened and hardened targets. We are establishing a test facility at the Sandia Optical Range at Kirtland Air Force Base to perform some of these measurements. This facility will be ready for operation in August 1983. We will also use existing facilities as scheduling permits. Ultimately we will use the High Energy Laser Systems Test Facility (HELSTF) at the White Sands Missile Range to begin full scale target testing by [deleted]. In general, we hope to complete our measurements [deleted] by 1988.

X-RAY LASERS: MISSION APPLICABILITY

Senator WARNER. General Lamberson, it appears from material submitted to the committee that the potential applications of x-ray laser systems for militarily-important missions is [deleted]. Would you comment?

General LAMBERSON. The system frequently called an "x-ray laser" is in fact a nuclear weapon, a third generation nuclear weapon. As such, it would be subject to all the limitations that nuclear weapons are subject to.

The Department of Defense and the Department of Energy are involved in research and experimentation [deleted] of the basic x-ray laser. I do not feel confident in commenting further on the limitations of x-ray laser systems [deleted].

GAO REPORT ON ASAT

Senator WARNER. General Brown, as you well know, the General Accounting Office has recommended a critical examination of the need for the miniature [deleted] vehicle ASAT system. Given the system limitations of this first generation ASAT, and the possibility that other antisatellite technologies may provide substantially greater capability, how great a priority do you attach to the fielding of this system at the earliest possible time?

General BROWN. The United States should have an antisatellite capability today. The Soviets presently have the ability to deny us support from assets in space, and we cannot deter that without the capability to respond in kind. [Deleted.]

ULTIMATE COST OF THE MINIATURE VEHICLE ASAT SYSTEM

Senator WARNER. General Brown, recognizing that a number of programmatic and force-goal decisions have yet to be made on the first-generation ASAT system, would you provide the committee with a sense of the range of total program costs being contemplated for various force goals? In your opinion, what factors will ultimately bear upon the decisions made concerning the total size of the miniature homing vehicle buy?

General BROWN. The programed cost from fiscal year 1983 through fiscal year 1987 is $2 billion. This pays for the flight test program and provides a fiscal year [deleted] initial operational capability with [deleted] modified aircraft and [deleted] missiles. It will take about $1.5 billion (then year dollars) from fiscal year 1988 through fiscal year 1992 [deleted]. Projected full force would be [deleted] modified aircraft and [deleted] missiles. The total buy of the "first generation ASAT system" will depend on (1) changes in the threat target set and (2) feasibility and growth of other satellite negation options.

PERCENT OF SOVIET SPACE ASSETS

Senator WARNER. How many of the Soviet Union's high-value space assets can be attacked by an anti-satellite system with the capabilities projected for the miniature [deleted] vehicle first generation system? By contrast, how many American satellite systems are put at similar risks by presently deployed Soviet antisatellite capabilities?

General BROWN. [Deleted.]

RELEASE AUTHORITY FOR USE OF ANTISATELLITE SYSTEMS

Senator WARNER. General Brown, would you describe the nature of the system envisioned for providing release authority to ASAT-equipped forces?

Give us a scenario in which such systems would be employed and a sense of

the time-frame involved in responding to an attack on our satellite systems by the Soviet Union.

General BROWN. The NCA will relay release authority through the National Military Command System [deleted].

PROBABILITY OF SOVIET BACKFIRE RANGE MISSIONS AGAINST UNITED STATES

Senator WARNER. To what extent could the recovery of Soviet bombers in third-party nations in the Caribbean and Central America permit modern, but shorter range systems such as the BACKFIRE bomber to execute a low altitude penetration of the United States? Do you assess such an attack to be a plausible and/or probable scenario?

General BROWN. [Deleted.]

GAO REPORT CRITICAL OF OTH RADAR DEVELOPMENT

Senator WARNER. As you know, the GAO has recently issued a report critical of the administration's plan for upgrading the Air Defense network with southern and west coast over-the-horizon radar systems. Would you comment briefly now, and in greater detail for the record, on this GAO report and its findings?

General BROWN. The GAO report recommends that the need for an Over-the-Horizon Backscatter (OTH–B) Radar be reassessed and the decision to acquire the OTH–B system be justified. Specifically, the factors to be considered are the threat, the status of efforts to develop more endurable tactical warning systems, and the potential and cost effectiveness of using existing airborne-warning assets to strengthen surveillance coverage against a precursor bomber attack until a more endurable system than OTH–B can be deployed.

[Deleted.]

SURVIVABILITY OF OTH–B

Senator WARNER. General Brown, how do you respond to the comment that the over-the-horizon system, like other components of our strategic warning system would not, in all probability, survive the initial exchange in a nuclear attack?

General BROWN. The mission of the Over-the-Horizon Backscatter (OTH–B) Radar System is to provide timely, reliable early warning of an air attack on North America. The system is designed to give warning time comparable to that obtained from ballistic missile warning systems. With this warning, time is available for survival actions of strategic retaliatory forces and for decisionmaking by the National Command Authority regarding responses.

Although the OTH–B radar system is not intended to be survivable against a direct attack, an attack on OTH–B, or any other warning system, would be an act that also constitutes warning.

SECDEF POSTURE STATEMENT VS TESTIMONY

Senator WARNER. The Secretary of Defense's Posture Statement indicates a planned procurement of five (5) OTH–B radars.

How does that compare with testimony indicating that two new systems will be procured?

General BROWN. Both statements are correct. The differences are due to references to "systems" and "radars" (or radar sectors).

The planned acquisition is for two OTH–B radar systems, one for wide area coverage on the east coast, another for coverage of west coast approaches. Each system consists of three 60 degrees azimuthal coverage sectors.

On the east coast, the existing Experimental Radar System will be upgraded with RDT&E funds to be the initial operating sector. Procurement funds will buy two additional 60 degree radar sectors in fiscal year 1984 to complete the east coast radar system and three sectors beginning in fiscal year 1985 for the west coast radar system.

AIR DEFENCE UPGRADES PAY FOR THEMSELVES

Senator WARNER. General Brown, it has been said that the defense upgrades planned in the President's budget would pay for themselves in ten years' time in operating cost savings. Would you document that statement for the record if it is factually correct?

General BROWN. Accounting to Life Cycle Cost Studies, JSS/ROCC will pay for itself 4.3 years after FOC with a cost savings after 10 years of $597 million. Similarly, the SEEK IGLOO radar replacement program including the Alaska ROCC will pay for itself in 4.7 years with a cost savings of $270 million. If cost savings resulting from CADIN-Pinetree reductions ($54M/yr) are applied to the North Warning Radar Replacement program, payback will occur 3.5 years after FOC at a cost savings of $254 million over the ten years. These paybacks are primarily due to the fact that these systems are replacing manpower intensive systems deployed in the 50s and 60s.

OTH–B and the AWACS aircraft are defense upgrades that provide additional capability not currently available to which cost savings may be applied.

QUESTIONS SUBMITTED BY SENATOR HENRY M. JACKSON

Senator JACKSON. How and why does a treaty limited defense work in conjunction with super-hard silos and some deception? Hardness appears to be the critical ingredient. Explain.

General BROWN. Super-hard silos combined with the relatively close silo spacing that such hardness permits force an attacker to precisely structure his attacks on U.S. ICBMs to avoid the effects of fratricide on his own forces. Achieving the required hardness of our ICBM silos is a basic ingredient of survivability. Hardness and spacing are selected together to prevent multiple kills—an important aspect of CSB. In addition, the presence of a defense system with, for example, a Spartan-like missile, can break up such tightly structured attack scenarios so the attacker is no longer certain of success. Alternately, a defense system can cause the attacker to be stretched out in time, increasing the attack price. The presence of a defense adds survivability insurance should the requisite levels of silo hardness not be achieved. In either case, the defense not only adds uncertainty to the outcome, but can provide a time window to allow the U.S. ICBMs to fly out on a retaliatory strike.

Deception also enhances U.S. leverage over the attacker due to the creation of a greater number of possible targets. The attacker does not know which of the available silos actually contain ICBMs. The use of a defense system and deception has a synergistic effect in protecting our ICBM resources as well as allowing more flexibility in preferentially defending a portion of our ICBM force.

BALLISTIC MISSILE DEFENSE DEVELOPMENT

Senator JACKSON. How much BMD development is left to do—or how much is already developed?

General BROWN. BMD development is geared to:

(a) Maintaining a U.S. capability and option to [deleted].

(b) Continuing development of critical components of a [deleted].

(c) Continuing development of an [deleted].

[Deleted.]

QUESTIONS SUBMITTED BY SENATOR CARL LEVIN

DEFINE ENDURING

Senator LEVIN. There has been much discussion of "protracted" nuclear war. This administration seems to think it must be ready to fight one. The former chairman of the JCS, Gen. David Jones, said he did not think it was worth spending money to prepare for such a contingency because you either couldn't do it successfully or it would cost much more than the U.S. taxpayers would be willing to pay. General Jones dismissed the likelihood of any nuclear war being protracted.

Can you say in open testimony what is the official planning factor DOD uses to define "enduring?" How long a nuclear war must we be prepared to fight? If all the strategic nuclear programs in the fiscal year 1984–88 five year defense plan are approved will we be able to achieve this required capability?

General BROWN. There is no official DOD planning factor currently used to define "enduring." U.S. strategic planning is based on a retaliatory strategy, and a significant portion of strategic forces must be capable of retaliating under a variety of attack scenarios.

We must be prepared to retaliate for whatever time period necessary to deny the enemy his wartime objectives. It is important to note here that the United States does not intend to fight any war, whether it be short or protracted. Instead, our strategy is to deter aggression. Only if deterrence fails will we engage in a conventional or nuclear conflict.

Approval of all strategic nuclear programs in the fiscal year 1984–88 FYDP would certainly improve U.S. C^3 and strategic forces endurance and effectiveness. Although not geared toward achievement of specific levels of strategic endurance, these programs link effectiveness and endurance in a complementary manner—one in which both aspects are improved incrementally.

SURVIVABILITY OF STRATEGIC TRIAD

Senator LEVIN. Provide for the record a chart with two timelines, fiscal year 1984 and fiscal year 1985 cases, showing the expected survivability of each leg of our strategic triad, our C^3 system, and our national command authorities, during the length of this required endurance period and showing the drawdown in launchers, warheads and C^3 nodes/systems when attacked by Soviet strategic forces as we expect they would attack and assuming planned U.S. counter attacks. Please provide a similar chart for Soviet strategic forces.

General BROWN. The issue of triad forces, C^3 systems, and NCA survivability is complex. There are a number of factors that bear on the problem, to include: the estimated threat; the attack scenario; force planning posture (i.e., day-to-day or generated alert); weapon system status (i.e., alert or non-alert); and postulated NCA response (i.e., ride-out or launch-under-attack). With such a large number of considerations influencing the issue, it is impossible to provide a single set of numbers as "the answer." When evaluating our strategic posture vis-a-vis the Soviets, it is necessary to consider the entire spectrum of conflict and all possible responses. With the above in mind, a range of values can be provided which are highly dependent on the specific considerations. For our bomber force, survivability ranges from [deleted] percent for non-alert forces to [deleted] percent for day-to-day forces on alert. Similarly, ICBM survivability ranges from [deleted] percent. Specifically, ICBM forces that ride out an attack today are expected to have a [deleted] percent survivability that drops to approximately [deleted] percent by 1988. ICBM forces that launch during the conflict survive at varying rates between [deleted] percent. Survivability of the C^3 system is highly dependent on the survivability of the individual nodes. Some nodes will be degraded by high altitude bursts and others are capable of surviving for some period of time. The specifics dealing with the submarine leg of the triad are best answered by the Navy. NCA survivability is a highly sensitive issue that is addressed at higher levels of government.

UPGRADING OUR AIR DEFENSE FORCES

Senator LEVIN. General Brown, has the Air Force done a cost effectiveness comparison between upgrading our air defense forces by substituting F–16s modified with improved radar and beyond visual range AMRAAMs and F–15s? If so, please provide detailed results for the record. If not, why not?

General BROWN. We have not done a specific cost effectiveness comparison between upgraded F–16s with the AMRAAM and F–15s in an Air Defense role. However, we have accomplished several studies on the relative effectiveness of these two aircraft. These studies showed the F–15 to be the more capable aircraft due to greater aircraft range, superior target detection and radar search volume and increased missile carriage potential. In an operational analysis of the F–16 with an improved radar and AMRAAM and the F–15, the F–15 proved more effective in the air defense role.

BMD

Senator LEVIN. Last year's Conference Report on fiscal year 1983 DOD Authorization requested the Defense Department to submit—at the same time the President submitted to Congress his decision on how to base MX—a report on how BMD would work along with the selected basing system, in other words:

". . . a report be provided detailing the role envisioned for BMD in the selected basing system, the technologies to be utilized, and the plan for developing and deploying the appropriate systems and their phasing with MX deployment."

That report was never submitted when President Reagan submitted his Dense Pack basing mode for MX to Congress. Why not? Why couldn't you tell us then what you would do with the BMD program?

Mr. GARDNER. Several alternatives were available to the President in basing MX. The report concerning the role for BMD in the selected system was started at the time the President's decision was made and submitted to Congress. Before the report was completed, Congress had completed action on CSB.

Senator LEVIN. I also have been informed that this report will not be submitted until after the Scowcroft Commission reports its MX recommendations to the President and he makes a decision, is that true?

Mr. GARDNER. Yes.

Senator LEVIN. This year's budget request for BMD is about $709 million, about $200 million above last year's appropriation and an increase of about 37 percent. The projection for fiscal year 1985 is that you will be requesting $1.57 billion for BMD, an increase above the fiscal year 1984 request of 121 percent. You cannot even tell us in a report we requested what you will be doing with this money, and yet you are projecting such huge increases. How can you possibly justify these increases on this basis?

Mr. GARDNER. The underlying objectives of the BMD program are to:

(a) Provide protection, if and when required, for our intercontinental ballistic missiles (ICBMs) and other high-value national assets.

(b) Maintain an evolving U.S. capability and hedge option to deploy BMD system(s) as a response to a breakout from the ABM Treaty by the Soviet Union. The Soviet Union has a system deployed at Moscow and are now upgrading it in a major way. The United States must retain a significant R&D program that keeps the lead-time to deploy a U.S. BMD system close to that now available to the Soviet Union. Our ability to deter the Soviets from breaking out of the ABM Treaty is contingent on retaining short lead-time to deploy a U.S. BMD system.

(c) Maintain a U.S. capability to evaluate Soviet antiballistic missile (ABM) developments.

The major portion of the funding is for conducting broad-based BMD research and development (R&D) applicable to possible protection of our ICBMs and other national assets. The remaining portion of the funding is for maintaining the hedge deployment option and for continuous evaluation of Soviet ABM developments. A significant increase from fiscal year 1983 is to begin R&D leading to demonstration of an [deleted]. All of these efforts support BMD program objectives and emphasize technology for future deployment options.

FUNDING FOR CSB DEFENSE

Senator LEVIN. General Tate, you have testified that the projected IOC for a BMD system for MX presented in your statement is predicated on MX deployed in the "Dense Pack" or closely spaced basing mode.

How much of your $709 milion budget request for fiscal year 1984, and your $1.5 billion projected budget request in fiscal year 1985, related to BMD work specifically related to protecting MX in a Dense Pack basing mode and what funding is for work applicable to BMD in any basing mode? Please provide a detailed, line item breakdown.

General TATE. Of the fiscal year 1984 request, $40.3 million of the System Technology Program (STP) element is specifically for maintaining the option of protecting Peacekeeper in closely spaced basing. The remainder of that program element is for work applicable to possible protection of ICBM's or other important national assets. The STP element is detailed as follows (dollars in millions):

High Altitude Defense	$55.5
Terminal Defense	195.7
Endoatmospheric Nonnuclear Kill	108.5
Sentry (Terminal Defense) Continuation	106.3
Hedge Option	40.3
Program Management	32.1
Total	538.4

OSB DEFENSE DESCRIPTION

Senator LEVIN. Your prediction of an IOC for a BMD for MX in Dense Pack is for what type of system—endoatmospheric or exoatmospheric or a combination of both?

General TATE. The hedge option that provides for an initial defense of Peacekeeper in closely spaced basing [deleted].

ENDOATMOSPHERIC DEFENSE EFFECTIVENESS

Senator LEVIN. Most experts believe that an endoatmospheric BMD system—without the help from an exoatmospheric BMD system—would not be very effective.

[Deleted.]

General TATE. The hedge option defense of Peacekeeper [deleted].

BMD PROGRAM CHANGES

Senator LEVIN. If the President's strategic forces commission rejects MX basing in Dense Pack, won't that require alterations in your present BMD program, including changes in its budget projections and schedules?

General TATE. While some alterations would be required, it is emphasized that BMD is a broadly based research and development program designed to support the President's strategic defense initiatives. The programs objectives are to achieve R&D milestones supporting a range of BMD options and an orderly growth path to accommodate advanced threats. It is possible that some emphasis may change, however, we believe we have a prudently structured and flexible program to fulfill BMD missions in the foreseeable future.

ABM

Senator LEVIN. Mr. Gardner, could you please provide for the record a detailed elaboration of DOD's position that deploying a BMD system around an ICBM field other than Grand Forks, ND would not require renegotiation of the ABM Treaty and any of its associated protocols, agreed statements, common understandings, etc.?

Mr. GARDNER. It is my understanding that the location of the U.S. ABM system at Grand Forks, ND, as stated in Common Understanding A, was a unilateral statement by the U.S. which is not binding. The negotiating record shows that the reason the Soviet Delegation insisted that the U.S. state for the record where its ABM area would be located was to have some assurance that it would not be positioned between two ICBM deployment areas and thus provide some protection for a larger number of ICBMs than permitted. Deployment in an area other than Grand Forks would not compromise this objective. However, such a deployment would require dismantling or destroying all ABM components at Grand Forks in accordance with appropriate procedures.

QUESTIONS SUBMITTED BY SENATOR JEREMIAH DENTON

BMD

Senator DENTON. What is the current significance and value of LoADs and Spartan technology in the BMD program?

Mr. GARDNER. The current significance and value of the terminal defense (formerly Sentry/LoAD and Spartan technology in the BMD program are that they:

(a) Provide the United States both the capability and option to deploy a: [deleted].

Senator DENTON. Is the possible deployment of a BMD system tied to MX deployment? What other cost-effective justification exists for deployment of a BMD system?

General TATE. The BMD program is not tied specifically to Peacekeeper deployment. The basic role of BMD is to provide a defense option to assure long time survivability of our ICBM force, as well as other high value military targets, including SAC bases and key command and control elements. In recent years, the BMD program has put primary emphasis on the defense of our ICBM force.

Senator DENTON. The current BMD program is primarily an R&D program. How do you justify the expenditure of considerable money on such an R&D program? Can the United States ever hope to field a BMD system within a reasonable time and within a reasonable budget?

General TATE. A fiscal year 1984 budget of $709 million is required to provide for and maintain a near-term deployment capability that is relatively insensitive to the ICBM or basing mode being defended [deleted] such as non-nuclear kill and other defense improvements to keep pace with threat growth. The program is oriented to maximize the use of extensive research experience and to support ongoing efforts in the areas of optics, radars, data processing, and interceptors. These evolving technologies are applicable to defense of Minuteman (MM), Peacekeeper, or other systems, such as the small road mobile ICBMS, as well as other military or high value targets. Technical demonstrations are planned to insure the feasibility of integrating these new technologies into evolving system concepts which are responsive to the projected threat. In this manner, the capability to advance into full scale development is maintained. Should a deployment decision be made, a BMD system could be fielded [deleted]. This approach will help to assure the fielding of the most cost-effective system possible for the assigned system.

Senator DENTON. The current emphasis of the BMD program is on nonnuclear technology. What implications does that emphasis have for the ABM Treaty? Can you effectively test nonnuclear technology in the context of the treaty?

General TATE. There are no apparent implications for the ABM Treaty because of the emphasis on nonnuclear technology. In general, it is envisioned that a nonnuclear interceptor would be a one-on-one replacement for a nuclear interceptor and therefore would not require changes in the treaty.

There are no restrictions on testing of nonnuclear BMD interceptors other than those that apply to nuclear interceptors as well. In fact, nonnuclear interceptors can be more completely tested than nuclear interceptors because the nuclear test ban treaty prevents the actual destruction of a reentry vehicle with a nuclear warhead.

Senator DENTON. Many people currently argue for space-based, nonnuclear BMD systems. It seems as if using space for defensive purposes is a logical evolution of the BMD program. What research and development activities are underway to consider the possibility? Is there inter-service cooperation? What problems do RDT&E in this area have in the context of the ABM Treaty?

General TATE. Space-based weapon systems have the potential for BMD and should be pursued in a logical evolutionary manner. A space-based element could provide the capability to negate a significant portion of the threat during its boost phase. A family of directed energy devices, including lasers, particle beams, and other directed effects concepts, is currently in various stages of technology development in both the United States and the Soviet Union. These technologies are clearly immature and no clear choice of a single technology is apparent in the foreseeable future, although it is not unreasonable to assume such a choice could be responsibly made within the next [deleted] years. Other space-based concepts employing more conventional interceptor technology to negate boosters have been proposed, and, while technically feasible, require extremely large and costly systems to be placed in space. The technology requirements of such systems are also not substantially different, with the exception of the device that actually kills the booster, from the directed energy weapon (DEW) system concepts. Space-based systems could be augmented with a CONUS-based element employing more conventional BMD interceptor concepts to negate most of the reentry vehicles which escape the space system. The two layers of the mixed force system work together synergistically to provide a better defense concept than a stand-alone space-based system; better in terms of reduced technology requirements, number of resources, cost, performance, and survivability.

The DOD Space Laser Program is a joint DARPA, Air Force, Army BMD effort to provide the basis for an informed decision in the [deleted] time-frame on whether to proceed with the military development of space laser weapon systems. The objectives, approaches, decision criteria, and budgets for this program are contained in a plan submitted to the Congress on 21 June 1982 by the Secretary of Defense.

The Ballistic Missile Defense Advanced Technology Center (BMDATC) program includes a number of activities directed towards the development of the technology base, the analysis of the system requirements, and the assessment of

the potential utility of future BMD systems employing DEW based in space. DEW candidates of interest for these applications include high energy lasers, particle beams, and other directed effects. The activities supporting potential space-based applications include the exploration of efficient, high brightness short wavelength laser concepts, the development of the laser damage data base with respect to Soviet booster targets, and the assessment of the requirements and utility of such space-based applications for a range of potential BMD missions. In addition, BMDATC, in conjunction with DARPA, is supporting the development of neutral particle beam technology at the Los Alamos National Laboratory; BMDATC also maintains an active interaction with both Los Alamos and Livermore in analyzing the potential BMD applications of the advanced DEW technology concepts under development by the Department of Energy (DOE).

A controversy clearly exists as to the application of the ABM Treaty to new concepts for BMD such as space-based DEW. The treaty prohibits the deployment of space-based, air-based, mobile land-based BMD components and requires consultations on the use of components that utilize other physical principles. [Deleted.]

Senator DENTON. What implications do Soviet BMD efforts have for the U.S. program and for the possible deployment of a U.S. system?

General TATE. [Deleted.] The Soviets have sufficient strategic offensive systems to hold the Minuteman force at risk and are continuing the buildup. Current Soviet BMD efforts make a vigorous U.S. BMD program essential if the United States is to avoid the destabilizing effects of technological surprises or a Soviet breakout from the ABM Treaty.

[Whereupon at 12:45 p.m. the subcommittee adjourned, to reconvene to the call of the Chair.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1984

THURSDAY, APRIL 7, 1983

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC AND
THEATER NUCLEAR FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

CHEMICAL WARFARE

The committee met in executive session, pursuant to notice, at 8:40 a.m., in room SR-253, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Members present: Senators Warner, Thurmond, Jackson, Nunn, and Exon.

Also present: Representative Ed Bethune.

Staff present: Frank J. Gaffney, Jr., George K. Johnson, Jr., Patrick L. Renehan, and James C. Smith, professional staff members; Willis D. Smith, deputy staff director and chief scientist for the minority; Karen A. Love, staff assistant.

Also present: Dennis P. Sharon, assistant to Senator Goldwater; John Campbell, assistant to Senator Warner; Jim Dykstra, assistant to Senator Cohen; Arnold Punaro, assistant to Senator Nunn; and Greg Pallas, assistant to Senator Exon.

OPENING STATEMENT BY SENATOR JOHN W. WARNER, CHAIRMAN

Senator WARNER. The committee will come to order.

We are now in executive session. I am assured by the clerk that all present here have the proper clearances.

Good morning, Senator Jackson. We have just started.

The Strategic and Theater Nuclear Forces Subcommittee meets today to consider one of the most controversial parts of the administration's fiscal year 1984 budget request.

As was the case in fiscal year 1983, funds are being sought to make possible the resumption of production by the United States of lethal chemical munitions. In its action on the authorization conference report last year, the Congress elected to defer such production.

The forthcoming congressional consideration of the renewed request contained in the fiscal year 1984 defense budget will, doubtless, be influenced by the record compiled in hearings, such as today's, by this subcommittee and others.

We are pleased to have as a witness today, Dr. Ted Gold, Deputy Assistant to the Secretary of Defense for Chemical Matters, who over-

sees all chemical weapons programs within the Department of Defense.

He is accompanied by members of the intelligence community and senior officers representing the Joint Chiefs of Staff and the military services. It is hoped these gentlemen will provide a comprehensive assessment of the threat posed by Soviet chemical warfare capabilities and the current state of chemical preparedness of U.S. forces to meet this threat.

In addition, it is expected that our witnesses will describe in detail the resulting requirement for enhanced American chemical defensive and retaliatory capabilities and the administration's plans to acquire these capabilities.

I welcome you, gentlemen. I have been very interested in this subject ever since I came to the U.S. Senate. In the past, I fought hard, sometimes, Dr. Gold, at 3 o'clock in the morning, in the recesses of the Chamber of the Senate to get this type of needed authorization and I am prepared to renew that effort this year.

Senator Jackson, we welcome you, of course. Do you have any comments?

Senator JACKSON. I have no comments, Mr. Chairman. I will listen.

Senator WARNER. We will start off with Dr. Gold.

STATEMENT OF DR. THEODORE S. GOLD, DEPUTY ASSISTANT TO THE SECRETARY OF DEFENSE (CHEMICAL MATTERS)

Dr. GOLD. Thank you very much, Senator.

Senator WARNER. Again, we are in executive session, I am assured by staff counsel.

Dr. GOLD. We have a very large group here today and part of the reason is because I need all the help I can get. This is an emotional issue. The problem that our forces face involves all the services and I believe it is important you hear not only the overview from DOD, but the unique perspective from each of the services. Also, we only get an opportunity like this once a year, so we brought in many of the people with the resources to be able to answer whatever questions you might have.

The agenda we have arranged for today's session is that I will provide a 10-minute overview and then I will be followed by Mr. Gasbarri from the DIA, and Capt. Ralph Wade, from the National Photographic Interpretation Center, who will give you an update on the threat. Then, General Klein from the JCS, General Baker from the Air Force, Admiral Barth from the Navy, and General Watson from the Army, will provide their own perspective.

I would like to cover three areas in my brief opening statement: The common ground in the debate, the current stockpile status, and an overview of the total program.

First is my assessment as to what the debate is all about. It is an emotional debate, but in spite of that, I believe there is a very substantial common ground which all participants in the debate hold and we should not lose sight of that very substantial common ground as we focus on what I believe is really the only contentious issue—the adequacy of the current stockpile.

Senator WARNER. I am going to ask you to just hold for a minute. I want to talk to my colleagues here.

Secretary Gold and other witnesses, Senator Jackson and I are of the opinion that at 10:15, when the committee hearings go open, that we will, assuming he is present, invite the Members of Congress and other Members who may wish to speak to this issue to make their statements.

Then we would desire to have each of you make your statements, even though somewhat repetitive, in the open session again.

Now, I bring this to your attention at this juncture in our hearings so that you might make a few notes on whatever logistical plans you may wish to follow so that we can be as expeditious as we can in the closed, and then when we proceed to open session, we will avoid as much redundancy as possible when you give your opening statements again.

You may proceed.

Dr. GOLD. As I mentioned, I believe the one really contentious issue is the adequacy of the current stockpile. That is an issue which, in large part, needs to be covered in a classified arena and we will focus most of our attention during this closed session on this issue.

I do want to review what I believe are shared judgments, the common ground agreed to by all those who have debated and thought about what a prudent and rational U.S. chemical warfare policy should be—I will list eight points which I believe are shared judgments and views.

No. 1. Nobody likes these weapons. Aversion to these weapons is as common in the military as it is outside. There is no constituency for them; no search for a higher form of killing as claimed in a recent book.

Senator WARNER. Really, I would consider your revising that statement. Nobody likes any weapons.

Dr. GOLD. I would say there is an aversion or abhorrence to chemical weapons that goes beyond that.

The second point of agreement is that there is a genuine desire that the best way to eliminate the threat of chemical warfare is with a complete and verifiable ban on chemical weapons.

Likewise, I believe most people harbor no illusions, however, about the nature of the adversary we face, an assessment underlined by the evidence of Soviet use and sponsorship of chemicals in Asia. There are few illusions about the difficulty in achieving the levels of verification needed for a ban on chemical weapons.

The third area of agreement is general acknowledgement that there is a threat. While the United States virtually ignored this arena for the better part of a decade, the Soviet Union did not, and they have a formidable capability to wage chemical warfare that must be deterred.

The fourth point of agreement is that there is no desire to increase or attempt to increase reliance on a nuclear response to deter chemical warfare. It is not credible in this age of at least parity in the nuclear arena and it goes against everyone's desire to raise, not lower, the nuclear threshold.

The fifth point of agreement is overwhelming support for the need to continue to strengthen our protective posture as a necessary and vital part of restablishing this deterrent posture.

However, that leads to the sixth point of agreement. Probably the most important one: A protective posture by itself is insufficient to deter. If one side has to operate in a contaminated environment in protective gear while the other side is unencumbered by such protective gear, that other side has a decided advantage on the battlefield.

I believe this point is acknowledged by almost all participants in the debate.

This leads to the seventh point, that, therefore, some sort of retaliatory capability is needed to complete the deterrent equation.

Finally, the last point of agreement is support of basic U.S. policy in this area. We will continue to have nothing to do with biological or toxin weapons, in accordance with the Biological Weapon Convention; we only possess chemical weapons to deter their use; and we will never use chemical weapons first.

I believe these eight points of agreement constitute a very substantial consensus on this very difficult subject. That leads to what I said before is the contentious issue, the adequacy of the current stockpile. However, even here there is considerable common ground in that one is arguing that we need a larger stockpile.

As a matter of fact, we will agree that a smaller stockpile could be sufficient if it contained the proper munitions. What we want to do in this session, and all the subsequent speakers after the intelligence briefing will focus on this point, is to highlight the characteristics of the current stockpile.

The mission of a deterrent stockpile is to have a capability to force the aggressor, the Soviet Union, into protective posture, or at least give him the option of taking actual casualties or virtual attrition if he gets into protective posture. If our current stockpile is indeed adequate for the mission and if our modernization program merely improves it, then I would admit there may be better places to put scarce national resources.

If indeed, however, our current stockpile is not adequate for deterrence and, thus, provides the Soviets an incentive to use their formidable capability to wage chemical warfare, then, by not taking action, we are making escalation to more horrible forms of warfare more likely and we are making arms control progress unlikely.

Again, we will focus on stockpile adequacy because I believe it is the real issue before us.

May I have the first vugraph.

CAPABILITY OF CHEMICAL STOCKPILE

UNSERVICEABLE	BULK	SHORT RANGE < 25Km		DEEP STRIKE NONPERSISTENT	DEEP STRIKE PERSISTENT	
		TOTAL	(USEFUL)		TOTAL	(USEFUL)
11%	61%	22%	(6%)	4%	2%	(0%)
MOSTLY ROCKETS. ALSO, LEAKERS, GUN SHELLS, AND A BAD LOT OF 155mm HOWITZER PROJECTILES	6% VX 14% GB 41% MUSTARD NO FILLING FACILITIES EXIST	MINES; 105mm AND 155mm NERVE AND MUSTARD; 8-INCH NERVE; 4.2-INCH MUSTARD MORTAR ROUNDS	155mm AND 8-INCH NERVE AGENT PROJECTILES	NERVE AGENT BOMBS	VX SPRAY TANKS	

Dr. GOLD. Very briefly the first chart offers a perspective of our chemical agent stockpile today. We have [deleted] agent tons. I will move through this table from left to right.

Eleven percent of our effort is in what I would call broken munitions. These are weapons which cannot be used under any conditions today. Most of them are old rockets for which the launchers have long been out of service.

The second category is bulk agent. About 61 percent of our chemical agent is in bulk storage. If we want to use it, and I emphasize this point, we have to start production. We don't have the weapons today that can use this bulk agent. We would have to design and develop munitions and either build or restore production capabilities that don't exist today. So, if for whatever reason one wants to use the agent effectively, it will still involve resuming production of chemical weapons.

Senator WARNER. According to current military requirement you would not use that current inventory?

Dr. GOLD. No.

Senator WARNER. So while it is there unusable in terms of not being packaged, it would not even meet the requirements?

Dr. GOLD. It is unusable today, and would present with the same logistical problems as our current munitions if placed into newly developed weapons.

Senator WARNER. It is about as useless as we can make it?

Dr. GOLD. That is right, short of actually demilitarizing the agent.

The third category on the chart is short-range systems. We have about 22 percent of our agent tons in the short-range systems which range from land mines, which have to be hand emplaced, to shells for 8-inch howitzers which have a range of about 23 kilometers.

Most of this short-range ammunition is not useful today because it was developed and produced 20 and 30 years ago when the weapons in our inventory were different. The key example is that we have over [deleted] shells for 105mm howitzers. There are hardly any 105mm howitzers in the inventory. Only a few dozen remain. It is a mismatch of the weapon munition and the weapon system.

Six percent of the agent tonnage is in short-range ammunition that is useful today: The 155 and 8-inch nerve agent projectiles. However, even these are limited. Most of them are filled with persistent agent which is not the appropriate kind to use in areas close to where your own troops may have to maneuver. Also, the range of the 155 chemical projectile cannot be fired to the full range of the new 155-mm howitzer. Finally, there is evidence of agent deterioration which causes concern about how far into the future these can be useful. I have established a blue ribbon panel of experts to investigate this last issue, and I can discuss this topic later.

Senator WARNER. At this point we had better make clear for the record how you designate these various categories of weapons, chemical and biological.

Nerve falls into chemical?

Dr. GOLD. Chemical, right. We don't have any biological agents or weapons. Basically there are two categories of chemical agents that we have in our stockpile today. First, a nerve agent which is further categorized into two basic types: Persistent nerve agent, that is, a

liquid that remains in a toxic form for long periods of time, perhaps days or weeks under certain conditions; and nonpersistent nerve agents, a liquid that volatilizes very rapidly and only provides a hazard for minutes or tens of minutes.

The other category of chemical agent in our inventory is mustard which is a blister agent. All these are chemical agents. We don't have biological or toxin agents.

Senator WARNER. Senator Jackson and I would like to have you put in the record again the international agreement on this overall subject of both chemical and biological.

Dr. GOLD. I can cover that now if you would like.

Senator JACKSON. Maybe a quick summary.

Dr. GOLD. There are two international agreements covering this. One is the 1925 protocol which essentially bans the use of chemical weapons in war.

Senator JACKSON. That grew out of World War I?

Dr. GOLD. That is right. It only bans its use. Many nations, including the United States and the Soviet Union, entered a reservation to that treaty which allows the use if somebody else uses it. So that is often referred to as the "No First Use" treaty.

Senator WARNER. Did you call it first use?

Dr. GOLD. No first use. The treaty bans any use. Many nations have entered a reservation which says we reserve the right to violate this treaty if somebody else violates it.

Senator WARNER. It is the use of the weapon, not the production?

Dr. GOLD. Not the production, development, stockpiling. It is the use in war.

The 1972 biological and toxin convention, on the other hand, bans anything to do with biological and toxin weapons, the development, production, and stockpiling.

A toxin is kind of halfway between a biological weapon and chemical. A chemical is produced from natural causes, you know, from a fungus. The convention bans the use of toxins, no matter what the source. Even though a toxin might be man-made in the laboratory, it is still banned by that.

Neither treaty has any verification or compliance measures. The Soviet Union is in violation of both those treaties now, the Biological Weapons Convention, from the standpoint of the yellow rain and the Geneva Protocol of 1925, because of the use of chemicals and toxins.

Senator JACKSON. Mr. Chairman, could we get into the situation in Southeast Asia where these allegations have been made and the United Nations has been involved and also, of course, Afghanistan on both the biological and the chemical?

There is no treaty on chemicals?

Dr. GOLD. There is a treaty. The Geneva Protocol bans the use of chemicals.

Senator JACKSON. Yes, but not on the manufacture?

Dr. GOLD. Not the manufacture.

Senator JACKSON. The "No First Use," but there is an absolute ban on the use of biological agents?

Dr. GOLD. The possession of them is banned.

Senator JACKSON. Use, possession, manufacture, or whatever?

Dr. GOLD. Yes, except for minimum amounts needed to do research on protective systems and medical treatment, and that is a very small amount.

Senator JACKSON. On the big controversy here, you know, we have been skirting the edge. No one, not even our own Government, has come out and presented the case that would confirm what so many are suspicious of, the violation by the Soviets in Cambodia and Southeast Asia and Afghanistan.

Dr. GOLD. We can get into that in the intelligence briefing. I think there is an overwhelming case that the Soviets are engaged in the use of chemicals. There are some technical arguments regarding the particular mechanism of the myco-toxin dissemination, but when you look at the entire intelligence picture that has been presented, I believe there is an overwhelming case.

The report of the U.N. Committee, headed by General Ezz, of Egypt, contained the basic finding that they could not confirm chemical use, but the report also said they couldn't confirm it because the Soviets and Vietnamese would not allow them to go in and be provided timely access to what was going on.

Senator JACKSON. What about the findings of a group of Australian doctors on this allegation of Soviet use of yellow rain in Southeast Asia?

They claim that the facts don't support it.

Dr. GOLD. It is my understanding that particular issue involves one group of samples only. As I stated, there is some degree of technical uncertainty about some of the aspects of the myco-toxin issue. I don't believe there is uncertainty at all about Soviet involvement in direct use in Afghanistan and sponsorship in Southeast Asia of chemical and toxin weapons.

If you are interested in following these areas, we can bring the experts in.

Senator WARNER. Again you use chemical only. What about biological?

Dr. GOLD. We don't have any evidence that they are using biological other than toxins which, by definition in the 1972 convention are treated the same as biologicals in international law.

Senator WARNER. So there is evidence of toxin use?

Dr. GOLD. Yes, and by the 1972 convention, even the possession of toxins is outlawed.

Senator WARNER. So there is a circumstantial case in that area as well as in the chemical area?

Dr. GOLD. Yes, sir; a very strong case backed by a large and growing body of physical evidence.

Senator JACKSON. But not the traditional biological?

Dr. GOLD. Not the traditional biological—right. It is the toxin, which is physically a chemical, but whose development, production, and stockpiling is outlawed by the Biological Weapons Convention.

Senator JACKSON. I understand. It is a matter of the use of terms here. It has been commonplace to refer to the 1972 treaty as outlawing biological devices. It is biological, and toxin is a derivative, I take it, of a chemical?

Dr. GOLD. It is a derivative of a biological process. It is not a living thing itself. It is a chemical, but it is derived from living matter.

Senator JACKSON. A synthetic?

Dr. GOLD. Some can be made synthetically. That was recognized when people drafted the treaty and toxins are outlawed no matter what the source. They are outlawed whether grown from fungus in a hothouse, or whether manufactured by man in the laboratory. No matter where they got it, if it is classified as a toxin, its possession, manufacture, and development and transfer to other parties is outlawed.

Senator JACKSON. That is helpful. Thank you.

Dr. GOLD. I was talking about the stockpile. I will now get to the deep strike capability.

Four percent of our stocks are in deep strike, nonpersistent weapons. These are bombs—bombs with a nonpersistent nerve agent. The toxicity dissipates in a very short time, in minutes. This is not the kind of agent that you need to impose degradation on their airfields, on their troop supply areas, on their whole second echelon force structure.

Finally, we go to the right side of the chart and we see where our grave deficiency is today—a lack of effective deep strike persistent capability. Only 2 percent of our total stock is in deep strike persistent systems and that is not at all useful today. It is in aerial spray tanks, similar to crop dusters. General Baker will tell you later what it takes to deliver them, but let me say it is virtually a suicide mission.

We now go to the far right of the chart and we see we have zero useful capability for deep strike. That is our critical concern today: Without any capability to deliver persistent agents beyond artillery range, we do not have an effective deterrent.

The Soviets with their rockets and bombs can attack, contaminate, and impose severe performance degradation on our forces in depth, our airfields, command and control centers, medical units, air defense units, our logistics nodes. We have no capability today to impose an equivalent degradation on them.

Without that capability, we do not have a deterrent. To repeat, this lack of capability to impose performance degradation on units beyond artillery range is the key deficiency in today's stockpile.

One last chart to help put the stockpile in perspective.

CHEMICAL STOCKPILE

	Current total	Current useful	Early 1990's proposed binary
Number of munitions	[Deleted]	[Deleted]	[Deleted]
Agent tons	[Deleted]	[Deleted]	[Deleted]
Munitions types	18	7	2

We have [deleted] agent tons today, [deleted] munitions; 17 different types of munitions. The useful part of the stockpile is what I identified before, that is the 6 percent in the nerve agent artillery and the 4 percent which is in the nonpersistent bomb. I believe we are stretching the definition of useful to include the bombs. The useful 10 percent consists of about [deleted] tons; [deleted] munitions and seven munition types.

The program that we are talking about, the program that has been categorized by some as a massive build-up, look what it will provide

us by the early 1990's. We will be building about [deleted] tons of munitions. By the way, to put that number in perspective, the United States demilitarized 7,000 tons of munitions and agents during the 1970's. So unilaterally we got rid of [deleted] obsolete munitions than we are planning to build over the next 10 years.

We are talking about two munitions, a binary artillery shell, the 155 millimeter that will provide us with a modern capability to meet our short-range needs and, probably the most important element in our program, the Bigeye bomb, which will give us the capability for the deep strike.

Late last year we ran into a development problem on Bigeye. Over the last few months we have conducted an intensive review of the program at the OSD level. To help us I assembled an outside group of experts headed by Walter LaBerge, previous Under Secretary of the Army and deputy to Bill Perry in the last administration. I asked them two questions: Is the basic concept sound, that is, can the problem be solved, and what are the risks of continuing on the current schedule?

Their answer to the first question is that the basic concept is sound, and the current problem can be solved.

I can describe the problem and our solution later. It has to do with problems that would occur if the bomb, for some reason, is not released from the aircraft after it was armed.

However, they said there is high risk in going on with the current schedule. Although the solution to the problem appears to require only minor hardware changes, additional testing and thus time is required to demonstrate that the bomb will perform as desired. We are in the process of putting together a new schedule now. We need that weapon, we need it as soon as possible. We don't want to delay it, but we don't see any alternative. The delay will mean deferring the procurement of binery munitions that we have in the fiscal year 1984 budget. We had requested $43 million for Bigeye production, but we will not now be prepared to spend that procurement money in fiscal year 1984 because of the stretched-out schedule.

I will be prepared to go into considerable depth on that.

Let me close with an overview of the program. We are asking for about $1 billion in the fiscal 1984 budget. As always, the bulk of that is in protective areas, $700 million for the protective aspects about equally divided between research and development and purchase of equipment, supplies, and facilities.

I think we have made some significant strides in the last year. Sometimes you can discern major progress by little things.

For example, our only chemical warfare laboratory in the United States, the Chemical Systems Laboratory, last year was designated as the most improved laboratory in the DARCOM community. Perhaps General Watson can provide additional details later.

Another sign—which perhaps is indicative of how serious the services are taking the chemical threat is an Air Force Airman magazine picture caption. They have a picture here of a crew in chemical gear loading a Sidewinder missile onto an F–16. Nothing very profound about the picture. The thing that really excited me is the caption. It is "A Crew Loading a Sidewinder Missile Onto an F–16 Aircraft."

It does not say "A Crew in Chemical Gear Loading a Sidewinder Missile Onto an Aircraft." I believe this is an indication of what is really important: That the services are recognizing that this is an environment they may have to face and are making this kind of training a routine part of their basic training, not something where you go out and put on your chemical gear once a year.

So, 70 percent of our budget request is for defense, a little less than 20 percent is for retaliation, and the bulk of that is to reestablish a production base. We do not have a production base in this country today. We don't have the capability to produce chemical munitions.

If we defer the procurement of Bigeye, that leaves $18 million for procurement of the 155-millimeter howitzer projectile.

Finally, we have almost 10 percent of our budget for demilitarization, which is our task of getting rid of this old, toxic, useless, and obsolete stock. We know how to do it safely. We know how to do it safely and environmentally acceptably.

We don't know how to do it safely, environmentally acceptable, and cheaply. We are getting rid of the material that poses the most hazard, and we are conducting a research and development program to find less costly methods of getting rid of the remainder.

This overview would be incomplete without mention about arms control, and perhaps we can best do that in the unclassified session. I was in Geneva in February. Congressman Bethune was there shortly after I was. The United States has made a major initiative in the chemical arms ban area.

We wanted to get Ambassador Fields here to this session, but the press of business in Geneva did not allow him to make it. I understand he has sent you a letter. I will close now and I offer my statement for the record.

If you don't have any specific questions of me now, I will turn it over to Mr. Gus Gasbarri.

[The statement of Dr. Gold is as follows:]

PREPARED STATEMENT BY DR. THEODORE S. GOLD, DEPUTY ASSISTANT TO THE SECRETARY OF DEFENSE (CHEMICAL MATTERS)

Mr. Chairman and Members of the Committee: I am pleased to have this opportunity to discuss our views as to how best to accomplish what we all desire: the elimination of the threat of chemical warfare. Before I describe our program in DOD to deter chemical warfare and our efforts to support the arms control process, I want to offer my perception of the issues involved. Often the smoke and noise associated with public policy debates in a democratic society obscure substantial areas of agreement. Such is the case with respect to the chemical warfare (CW) issue.

My assessment—from the perspective of a Department of Defense official responsible for CW programs and an active participant in last year's Congressional review process—is that there is a widely shared common base of beliefs and judgments represented by the following:

1. An aversion to chemical weapons and warfare which is as common among the military as civilians. A diagnosis of the reasons for such beliefs is beyond the scope of this discussion; undoubtedly they reflect basic human values as well as remembrance of World War I experiences. In any event the result is that there are few if any enthusiasts for chemical weapons within the U.S. military and no advocates for developing "a higher form of killing" as suggested by a recent book of this title.

2. A genuine and deeply felt desire for a complete and verifiable ban on chemical weapons as the best way to eliminate the threat of chemical warfare. However, there are few illusions regarding the nature of our principle adversary,

an assessment underlined by the evidence of Soviet use and sponsorship of chemical and toxin weapons in Southeast Asia and Afghanistan. Similarly there is appreciation of the formidable challenges of achieving an effective level of verification and of the serious and difficult negotiations that lie ahead.

3. Widespread recognition that Soviet CW capabilities pose a severe threat to United States and Allied forces and therefore their use must be deterred. The United States virtually ignored CW during much of the 1970s—allowing our chemical retaliatory and protective capability to decline and neglecting relevant training and doctrine—in the hope that the threat of such warefare would diminish and eventually be eliminated by arms control progress. However, agreement was not achieved and the Soviet Union did not match our restraint. Soviet military doctrine envisages the use of chemical weapons and acknowledges their value. The USSR today possesses a variety of lethal and incapacitating chemical agents and the means to deliver them, including missiles, rockets, artillery and aircraft. They have a large and well-trained chemical organization. They have an active and expanding chemical proving ground, and they train with actual, though diluted, chemical agents. They have invested heavily in protective and decontamination systems and have distributed these widely to their forces. In addition to these extensive programs for standard types of chemical agents, a major biological accident at a military-controlled facility in Sverdlovsk and evidence of toxin use in Asia indicate that the USSR's arsenal also includes toxic substances specifically prohibited by the Biological and Toxin Weapons Convention of 1972.

4. No desire to lower the nuclear threshold by attempting to increase reliance upon our nuclear posture to deter chemical use. In any event, the relative gains by the Soviets in both the strategic and non-strategic nuclear arenas over the past twenty years eliminate such a posture as a credible option.

5. Strong support for the need to improve the CW defensive posture of U.S. forces through research, development and procurement of protective equipment and increased training.

6. General acknowledgement that, although improved protection is necessary, alone it is insufficient to deter and thus a chemical weapon retaliatory capability is also needed. Protective equipment and procedures can save lives and reduce casualties, however they also impose severe operational restrictions. Therefore an initiator of chemical warfare gains a decisive advantage if he can operate largely unencumbered by protective postures and contaminated environments while imposing severe restrictions on the other side's forces.

7. Finally there is agreement that the United States—in accordance with International treaties—should continue to have nothing to do with biological or toxin weapons and should continue its no-first-use policy with respect to chemical weapons. The only purpose for the United States to possess chemical weapons is to deter others from using them.

I will not devote much further attention to these "shared views" in my statement. We are prepared, of course, to go into as much detail as you desire on any of these points.

Taken together these shared beliefs and judgments constitute a solid foundation for U.S. chemical warfare policy and programs. Given such an impressive scope of agreement, what then is the debate about? The major point of contention is the adequacy of the current U.S. chemical stockpile to fulfill its deterrent objective. However, even on this issue there is substantial common ground. In particular it is agreed that there is no need to enlarge the size of the U.S. stockpile; in fact a smaller stockpile can be adequate for deterrence if it contains the proper munitions. The issue reduces to whether the existing stockpile can force the initiator of CW into a degraded protective posture.

If our program merely improves upon an already adequate stockpile, then there are probably better places to devote scarce national resources. If, however, the current stockpile is not adequate, or will not be adequate in the near future, then failure to redress this situation makes war more likely, makes escalation to more terrible forms of war more likely, and makes arms control progress less likely.

We will make the case that our stockpile is indeed not adequate for deterrence. As I have already stated, military forces operating in protective equipment in a chemically contaminated environment suffer severe degradation of performance. The causes of performance degradation are twofold: individual protection and unit defensive procedures. First, there are the encumbrances of the protective equipment itself. Wearing equipment designed to protect against a very hostile environment unavoidably increases the heat load on the individ-

ual and makes physical activity difficult to impossible depending on the temperature. Also there is the loss of visual acuity caused by wearing a mask, loss of manual dexterity caused by wearing protective gloves and the loss of maneuverability caused by wearing protective boots. There are also considerable problems in communication among individuals wearing masks and protective hoods. Added to the encumbrances of the protective equipment are the problems caused by the additional tasks that must be accomplished to survive on the contaminated battlefield. These include contamination avoidance procedures, decontamination of both personnel and equipment, and increased logistical burdens.

Therefore, to deter, we need to possess the capability to impose operational degradation upon the aggressor approximately equivalent to the degradation imposed upon our military forces. This, in turn, requires that our forces can operate in a contaminated environment at least as well as the aggressor and we possess delivery systems/chemical munitions that can force the aggressor into a protective posture (or suffer high casualties). With both sides in protective postures in a contaminated environment, operations would slow down and perhaps grind to a halt. Thus, as long as our potential adversaries know their military forces would also have to face the encumbrances of chemical contamination and protective posture they would perceive no advantage from initiating chemical warfare. In short, they would be deterred.

The major problem with the current stockpile is obsolescence of delivery means. Most of the munitions in the stockpile were produced in the 1950s and early 1960s and can no longer be effectively delivered on the modern battlefield. The most critical deficiency is a lack of capability against targets beyond artillery range. Thus the United States is faced with a situation where the Soviets can attack, contaminate and severely degrade operations at our airfields, logistic nodes, command and control facilities, and other vital combat support and supply functions while we have no capability to impose similar restrictions on them.

CAPABILITY OF CHEMICAL STOCKPILE

UNSERVICEABLE	BULK	SHORT RANGE < 25Km		DEEP STRIKE NONPERSISTENT	DEEP STRIKE PERSISTENT	
		TOTAL	(USEFUL)		TOTAL	(USEFUL)
11%	61%	22%	(6%)	4%	2%	(0%)
MOSTLY ROCKETS. ALSO, LEAKERS, GUN SHELLS, AND A BAD LOT OF 155mm HOWITZER PROJECTILES	6% VX 14% GB 41% MUSTARD NO FILLING FACILITIES EXIST	MINES; 105mm AND 155mm NERVE AND MUSTARD; 8-INCH NERVE; 4.2-INCH MUSTARD MORTAR ROUNDS	155mm AND 8-INCH NERVE AGENT PROJECTILES	NERVE AGENT BOMBS	VX SPRAY TANKS	

The above chart and following indented text describes the U.S. stockpile of chemical weapons and agent in terms of its military capabilities and utility.

Unserviceable.—Eleven percent of the total agent is in ammunition which has been formally declared unserviceable or obsolete. Most of these are M–55 rockets filled with GB and VX nerve agent and the compatible multiple rocket launchers have been phased out of service. Also included are shells for an obsolete 155mm gun and leaking and other ammunition that is unsafe to fire.

Bulk Agents.—Over 60 percent of the agent tonnage is stored in one-ton bulk containers. Most of this bulk agent is mustard, a blister agent. There are no filling facilities for mustard. Bulk GB nonpersistent nerve agent accounts for

15 percent of the agent stockpile. The GB production and filling facility at the Rocky Mountain Arsenal, Denver, CO has not operated since 1969 and is in a laid away, not maintained, status. Extensive renovation would be required before it could be used to fill new munitions. Additionally, the Denver metropolitan area now partially surrounds the arsenal. The remainder of the bulk agent is VX, a persistent nerve agent. It was produced at the Newport Army Ammunition Plant, Newport, IN, which is also laid away and would require extensive rework before munitions could be filled there. The only present capability to use bulk agent is as fill for a very small number of Navy refillable spray tanks.

Short-range Systems.—Twenty-two percent of the agent stockpile is in short-range systems, varying in range from mines, which must be hand emplaced, to 8-inch artillery projectiles which can be fired to about 23 kilometers. Most of these munitions have little military utility today. The most numerous items in the stockpile are projectiles for the 105mm howitzer. This howitzer, once numerous, is being phased out and only a few remain with the Marines and Army airborne units. The 4.2-inch mortar, also being phased out, has serious drawbacks as a chemical system because of its extremely short range (about 4 kilometers). A large part of our artillery munitions are filled with mustard agent. Mustard artillery is of limited value because of its persistency (a desirable characteristic for deep strike, not so for areas where friendly forces might need to maneuver) and because it freezes at 58° F (the vapor produced by the solid mustard is still effective, the problem is the frozen agent causes an unbalanced shell and unpredictable flight). The short-range systems of significant military utility today are the 155mm and 8-inch nerve agent artillery projectiles which constitute six percent of the total stockpile. There are limitations with these as well, many are filled with the less useful (for short range systems) persistent agent and the 155mm projectiles cannot be fired to the maximum range of the new howitzers.

Deep Strike Nonpersistent.—GB filled bombs represent four percent of the agent stocks. GB is highly lethal by inhalation and can render personnel incapable of performing military duties at doses far below lethal, thus, enhancing its effectiveness. However, it is nonpersistent. For example, at 60° F the contamination pattern for a typical GB weapon would last from about 2 minutes at the fringes to about 40 minutes in the heaviest areas. Consequently, it does not require extensive decontamination nor prolonged degrading protective measures. A more persistent agent such as VX or mustard is needed for deep attack.

Deep Strike Persistent.—Two percent of the agent stockpile is persistent VX loaded into Air Force TMU–28/B spray tanks. Aerial spray is one of the best ways to get a uniform agent dissemination and this was once an effective delivery means. Unfortunately, the tactical environment has changed dramatically since the spray tanks were developed. The advent of modern air defenses makes the delivery parameters for these weapons extremely hazardous. They involve flying straight and level over the target in a mode that is too high, too slow, and too long.

In summary, the stockpile capabilities have declined as weapons systems were phased out, leaving much chemical ammunition useless. Additionally, the changing nature of warfare has eroded the utility of critical portions of the stockpile; most specifically the spray tanks which had provided a deep strike capability.

I next turn to a description of U.S. CW strategy and program. The U.S. objectives are: to eliminate the threat of chemical warfare by achieving a complete and verifiable ban on chemical weapons and, until such a ban is obtained, to deter the use of chemical weapons against us or our Allies. The United States is party to and adheres to the two existing international agreements—the Geneva Protocol and the Biological and Toxin Weapons Convention—that deal with chemical and biological warfare. However, these treaties do not go far enough and more importantly lack the verification and compliance mechanisms needed to make them effective.

From 1977 to 1980, the United States participated in 13 rounds of negotiations with the Soviet Union in an attempt to reach agreement on a verifiable ban on chemical weapons. Unfortunately, these efforts stalemated, principally due to fundamental disagreement on verification provisions and particularly due to Soviet intransigence on questions relating to on-site inspections. The United States is continuing to work toward a chemical weapons ban within the forum of the Committee on Disarmament.

In June 1982 the Soviet Union offered a chemical weapon ban proposal that offered some hope of movement on their part toward acceptance of adequate

verification mechanisms and in particular on-site inspections. However, subsequently the Soviets have been unwilling to elaborate their views or provide details on their position. In February 1983, Vice President Bush addressed the Committee on Disarmament in Geneva and exhorted the members to push forward a chemical arms ban: "The Committee is confronted with numerous important issues. None has a higher priority for the United States than the efforts to ban forever an entire and different class of weapon from the world's arsenal. . . . I urge all members of this Committee to begin negotiating this session to resolve the key issues that face us in this area and to join with us in achieving a complete and verifiable ban on chemical weapons." Several days later the U.S. Ambassador to the Committee on Disarmament, Louis Fields, presented to the Committee a paper containing the United States detailed views on the content of an effective convention. As Ambassador Fields stated, the United States is ". . . not seeking absolute verification and we do recognize that some risks will have to be accepted. However, we do insist that these risks be minimized in order to safeguard our security and that of other countries. We must have a level of verification which meets that objective."

I was in Geneva, supporting the U.S. Delegation to the Committee on Disarmament, during the period the Vice President addressed the CD, and the United States offered our detailed views paper. I offer for the record the Vice President's speech, Ambassador Fields speech, and the United States detailed views paper.

I also had the opportunity to meet with our Allies and many of the nonaligned delegations. My purpose was to demonstrate DOD support of the arms control process and our strong commitment to the goal of a complete and verifiable ban on chemical weapons. I also attempted to convey an equally strong commitment to take those steps necessary to protect our forces and deter chemical use against them until such a ban is achieved.

Necessary conditions for CW arms control progress are that the Soviets perceive no advantage for chemical weapon use and pressure from the international community to move them toward acceptance of effective verification and compliance measures. Whether these will be sufficient to motivate them to accept international on-site inspections and effective challenge procedures in an open question. We believe that our detailed views paper can provide a framework for an effective convention and an impetus for progress; however, progress clearly rests on the Soviet willingness to address seriously the verification issue.

I believe the multilateral forum is a correct one for this issue at this time. I was impressed that many of the nonaligned, as well as our Allies, support strong verification and compliance measures including on-site inspections. The evidence of the use of chemicals in Asia apparently has had an impact especially with respect to highlighting the importance of verification and compliance measures to arms control treaties. Soviet intransigence on verification is visible to our Allies and the nonaligned. Furthermore, as many of the nonaligned expressed to me, this is truly a multilateral, and not merely a United States-Soviet issue. They emphasize that chemical use against small nations is more likely than between the Super Powers who have, or can acquire, the means to deter such use.

What must we do to deter? We have been unable to eliminate the CW threat through unilateral restraint. In view of the overall military balance, we cannot rely on the other components of our military capabilities—in particular nuclear—to deter chemical warfare. Moreover, Soviet CW advantages can offset the improvements in conventional posture for which NATO is striving. Consequently to restore an adequate deterrent we need to improve our CW capabilities sufficiently to deny the Soviets the significant military advantage they would now gain from using chemical weapons. Our program is structured and sized to do this and no more. The nature of chemical warfare is such that we need not match the Soviets in force structure or stockpile size to have an adequate deterrent. Our program to deter chemical use has two principal components: improving the protective posture of our forces against chemical attack and restoring an adequate retaliatory capability.

Our program also provides for the disposal of chemical munitions and agents. This is a formidible task because of the agent toxicity and the need to destroy or decontaminate metal parts and other components that may have been in contact with the chemical agent. If a verifiable ban is achieved the United States will, of course, dispose of its entire chemical stockpile. In the absence of such a ban, and independent of decisions regarding new munitions procurement, we plan to dispose of our unserviceable and obsolete munitions and chemical stocks, which

constitute most of the current stockpile. Indeed, since 1972, the United States has safely demilitarized over seven thousand tons of chemical agent in munitions or in bulk containers. The weapons demilitarized include Honest John warheads, GB cluster bombs, M–55 rockets, and hydrogen cyanide bombs as well as bulk agent.

Highest priority for disposal is accorded those munitions that pose the greatest potential safety problem and we expect to complete the disposal of such currently identified munitions by the end of the decade. We know how to dispose of lethal chemical munitions and agents in a safe and environmentally acceptable manner. However, the cost of accomplishing this with current techniques is very high, estimated to be as much, or more, than $2 billion (in fiscal year 1983 dollars) for disposal of the entire existing stockpile over a 20 year period. We would be delighted to dispose of the entire stockpile sooner, even accepting higher costs, if we can achieve a verifiable ban. We are investing considerable effort in R&D including the operation of a disposal pilot plant in Tooele, Utah, to find less costly means of disposal.

In improving our protective capability, we seek to ensure that our military forces can survive and sustain operations in a contaminated environment with minimum performance degradation.

Although we are not yet where we need to be with regard to chemical protection, considerable progress has been made. Of most significance is the increased chemical related training in all Services; Army, Air Force, Marines, and the Navy. Instructional time devoted to chemical defense has increased, the number of trained specialists has increased, the amount of time spent by operational units in protective gear has increased, and the frequency and extent of chemical operations in major field exercises has increased. Individual protective equipment is available to Army, Air Force and Marine units. The Navy is in the process of equipping its personnel and using fiscal year 1983 funds to completely outfit amphibious forces. Improved detection equipment has been fielded, and a very promising collective protective system was installed and is under going test at Ramstein Air Base, Germany.

However, both qualitative and quantitative deficiences in our chemical protective capability remain. Major deficiencies for all Services are the lack of protective clothing which is not debilitating in its own right; collective protection systems for key equipment, facilities, and rest and relief areas; adequate detection and warning devices capable of responding to all threat agents; a monitoring capability to rapidly assess location and extent of contamination; decontamination equipment and agents which are effective and usable on all equipment; and the capability to treat large numbers of chemical and conventional casualties in a toxic environment. Finally, much remains to be done to implement relevant training and develop appropriate doctrine.

The objective of the retaliatory component of our program is to have the smallest, safest stockpile that denies a significant military advantage to any initiator of chemical warfare. We need not, and will not, attempt to match the Soviets in agent/munition quantities and types. Rather, our stockpile requirements are prudent and restrained: to force the initiator of chemical warfare to operate encumbered by protective clothing and burdened by the logistics and redirection of combat power necessary to sustain operations in a chemical warfare environment. Because the size of the Soviet chemical stockpile would have little bearing on the number of suitable chemical targets in their force structure, our munitions requirements are largely insensitive to changes in their stockpile size.

The U.S. program to improve our chemical retaliatory capabilities consists of three elements. First, we are improving the utility of the current stockpile through maintenance, planning, and training. Second, we are seeking to reestablish a capability to develop and produce chemical weapons. Finally, we are seeking to redress the most critical stockpile deficiencies by acquiring a deep strike chemical weapon and a modern artillery projectile.

In the short term, we can increase the credibility of the chemical deterrent by improving our abilityto employ the potentially useful portion of the existing chemical weapons stockpile. That is the approximately ten percent which is in ammunition compatible with available weapon systems and modern warfare—the 155mm and 8-inch nerve agent artillery projectiles and the chemical bombs. Maintenance is on-going to bring these items to ready-for-issue status. This maintenance consists of inspection, derusting and painting, and replacement of missing or faulty components. Efforts are also underway to develop realistic

deployment and employment plans, to evolve modern employment concepts and doctrine, and to train military forces and key decision makers. However these efforts, by themselves, are of limited value because they cannot redress the fundamental retaliatory shortfalls. No amount of maintenance, training, or artful planning can create an effective deep target persistent agent capability when the weapons do not exist. Similarly, maintenance, training, and planning cannot affect the internal quality of the munitions, halt or reverse deterioration, and guarantee a viable stockpile into the 1990s. Until a chemical disarmament agreement can be achieved, a viable stockpile is essential, and this requires modernization.

The first component of a modernization program is to reestablish a capability to develop and produce chemical weapons. The R&D base for chemical weapons, like that for chemical defense, was allowed to deteriorate during the 1970s. It is not necessary to have an establishment as extensive as that which existed in the 1950s and 1960s. Our intent is to establish a Tri-Service community capable of keeping up with technology, articulating realistic requirements, and developing a limited number of low cost modern ground and air launched weapons. These capabilities are equally essential to avoid surprises that could negate our chemical protective systems.

The production base for chemical agents and weapons has deteriorated significantly. Three facilities remain from the pre-1969 era. These are the Phosphate Development Works, Muscle Shoals, AL, which produced DC, a precursor for the nerve agent GB; the Rocky Mountain Arsenal Denver, CO, which produced GB and filled munitions; and the Newport Army Ammunition Plant, Newport, IN, which produced the nerve agent VX and filled munitions. All these plants were laid away in unmaintained status and would require extensive renovation to operate again. In FY 1981, Congress approved construction and equipping a plant at Pine Bluff Arsenal, AR, capable of producing the 155mm binary artillery projectile. Construction on the facility is underway and is expected to be complete in November 1984. In FY 1984, we are seeking additional funding to reestablish sources for chemical precursors and provide a production capability for the Bigeye bomb.

Establishing a production base will provide advantages in and of itself. It will convey to the Soviet Union a strong signal that they cannot stonewall international efforts to achieve a verifiable chemical weapons ban and still prevent the United States from taking tangible steps to improve its deterrent posture.

The final component of modernization is the actual production of chemical weapons. The highest priority for new munitions is to provide the deep strike capability that we lack today. In addition, evidence of physical deterioration raises concern about the future reliability of our current artillery projectiles. Therefore our program calls for producing two new munitions: the Bigeye Binary Bomb to provide the deep strike capability, and a 155mm binary projectile to assure that we will have the balanced delivery means needed to provide an adequate deterrence. These munitions will not be available in significant quantities until the very late 1980s at the earliest because of the time required to reestablish a production capability and the lead time of procuring components parts.

The binary munitions we are developing contain two separate, relatively nontoxic substances which are mixed to yield standard nerve agents. In manufacture, storage, and shipment, the two binary components will be separated. The components will not be mated until authority is received to conduct retaliatory chemical attacks, and the actual agent is not produced until the munition is in flight to the target.

Binary munitions are preferable to unitary munitions, because they can be more easily moved forward in times of crisis; do not present a hazard if damaged on our munitions areas, a particularly severe problem for unitary chemical munitions aboard Naval vessels; and provide significant safety and logistical advantages in manufacture, storage, and transportation. Finally they do not present the disposal problems that our current unitary munitions do since toxic agent would never be produced unless these weapons are used. We have no desire to add to our already formidible task of disposing of the current unitary stockpile.

In the area of chemical retaliatory capabilities and programs, we have kept NATO informed of U.S. capabilities, objectives, and policy. United States chemical retaliatory policy is fully consistent with NATO policy, although the military capabilities to implement that policy are seriously deficient. The decision

to improve the United States' retaliatory capabilities involves development and production only. No decisions or recommendations have been made regarding deployment of chemical weapons. Should it ever be determined that overseas deployment is necessary, there will be full consultation with the nations involved prior to making any decision. Although forward deployment of munitions can enhance their value, the procurement of militarily useful chemical munitions will help restore an adequate level of deterrence even without such deployment. Production decisions require years to implement. By contrast, deployment of useful quantities of munitions, although certainly not a trivial task in times of crisis, could be implemented within days or even more rapidly in many circumstances.

The fiscal year 1984 chemical warfare budget request is slightly less than a billion dollars. Over 70 percent, almost $700 million, is for chemical protection. This amount is approximately equally divided between R&D and acquisition. Retaliatory programs amount to about 20 percent of the total, with the largest share being sought to establish a production base for the Bigeye bomb and the binary artillery projectile. There are also funds for R&D, maintenance, and procurement of munitions. A little less than ten percent is requested for demilitarization of existing unusable chemical weapons including funds for RDT&E, continued operation of the pilot plant at Tooele, Utah, and to construct a facility at Pine Bluff Arsenal, AR, to safely destroy the BZ incapacitating agent and munitions.

Planned expenditures for the chemical warfare deterrent program, including the disposal activities, are approximately $7 billion for the five year, 1984–1988 period. Chemical protection will account for more than two-thirds of the projected costs, with the remainder allocated to provide a retaliatory capability and to dispose of obsolete existing chemical stocks.

Our program to deter chemical warfare evolved from studies conducted over the past ten years, beginning with the recognition of the threat that grew out of the lessons of the 1973 Arab-Israeli war. A particularly important contribution was made by the 1980 Defense Science Board Study. A high quality group of experts, representing a broad spectrum of backgrounds, was brought together and chaired by Professor John Deutch of MIT. They reviewed the major aspects of CW—policy, protection, weapons, intelligence, demilitarization and technology—and produced an excellent report. Our current program, including the creation of my office, derives from their recommendations.

In summary, U.S. policy and intentions with regard to chemical weapons are clear. We do not like these weapons. We do not want these weapons. We will not use them first. Our only purpose in possessing them is to deter their use against United States or our Allies. Since the end of World War I, all use of toxic chemical weapons has been against those who could not protect themselves and who had no ability to retaliate. Even in the intense European conflict of World War II Hitler did not use his chemical arsenal. He believed the Allies stood ready to retaliate.

The United States shares the goal of most nations to eliminate the threat of chemical warfare by achieving a complete and verifiable ban on chemical weapons. Our program supports this goal by improving U.S. military posture sufficiently so that the Soviets will perceive they have little to gain from such warfare, thus giving them the incentive to join us and other nations in achieving a complete and verifiable ban on the development, production, and stockpiling of such weapons. If we are successful, we will be able, and in fact eager, to terminate the chemical weapons program at any time.

Senator JACKSON. One final question.

Negotiations have been going on now in Geneva since 1974 or 1975, but are going absolutely nowhere.

Dr. GOLD. I guess you would have to really be an optimist to say that there was progress. We have had almost 4 years of bilateral negotiations with the Soviets from 1977 to 1980 which really didn't get anywhere. They established a framework, but there was no significant motion on the substantive issue which is verification. Verification and compliance are the only real issues.

Everybody agrees on the scope. We all want to get rid of them. There is not the problem of symmetry as you have in the nuclear arena,

that is, what systems are equivalent to what other systems. The only concern is how do we get adequate verification.

Senator JACKSON. It is on-site inspection.

Dr. GOLD. It has to be. The most encouraging sign I saw at the Committee on Disarmament was the nonalined nations spreading the message that we need on-site inspection; that we cannot have any more treaties that don't have meaningful verification and compliance mechanisms.

I think the lessons of Afghanistan and Asia are causing that perception of the NUCS for on-sight inspection. Those who are not absolutely convinced of our case of Soviet use are convinced that the Soviets are stonewalling. If you guys want to show us there is no fire, why don't you let people in to see for themselves.

General Ezz of Egypt who headed the U.N. team, was probably the most articulate spokesman for that point of view. Treaties without effective on-site verification are not only useless, they are counterproductive because they lead to and breed a suspicion which destroys the very environment you want to create.

To repeat, the one encouraging sign is that not only our allies, but the nonalined are taking a tough and vocal stand on the need for on-site inspection. Whether that is sufficient to motivate the Soviets to go forward is unknown, obviously it would be a precedent-breaking step on their part to agree to have on-site inspections.

Senator JACKSON. I just want to say, Mr. Chairman, I think we can do a lot more in getting the message out on what has happened in Afghanistan and Cambodia because it is obvious that the real danger to the nonalined countries is that they are going to be the ones that they will do the experimenting on.

Dr. GOLD. Absolutely.

Senator JACKSON. It would seem to me that the opportunity here in the political area is just enormous. We have not fully exploited the possibilities. The Soviets are getting away with it in a brazen way.

Senator WARNER. Senator, that I think is a very key point. With your key words, "We have not exploited," is it your suggestion that the administration has not divulged fully all the facts? Could you amplify on that?

Senator JACKSON. What I am saying is that it is a kind of stop and go story. We go so far, we have really not pushed I think hard enough in the United Nations, and to follow it up I think there ought to be hearings. I think you can get some private groups to hold hearings. There are all sorts of opportunities that are available with all of our investment in Voice of America and all the other programs, Mr. Chairman. I think we are missing a bet here.

I know what the Soviets would do if the shoe was on the other foot. They are getting more and more brazen. It is just like what happened in France yesterday or the day before. I think that message is going to have a profound impact among the far left because if a government that has four members in the cabinet that are Communists have thrown 47 Russians out, I think that ought to have some credibility.

I think that is what the Russians are going to worry more about, not a right wing government in France. It is a government that has been allied from time to time in the various elections, less alined

in this last election, but Mitterrand and his people have worked with the French Communists. Anyone who knows the post-war history of the Communist Party in Europe knows that these are not Ural Communists; they are Stalin Communists.

They are disciplined more so than some of the Communists in the other states. We have forgotten about Ural Communists. Remember when we talked about the Ural Communists in Italy, Spain, and elsewhere, never once did they ever talk about the liberal Communists in France because they are Stalin Communists.

It comes, therefore, I think as a shock to the far left that this was going on against their comrades in France. These are the opportunities that we need to exploit that could be far more devastating than adding $10 billion to the defense budget.

Not that I am suggesting that we trade one off for the other, but I just think that we are not taking advantage of opportunities.

I would mobilize a lot of the free trade union movement. That brings a message in Europe at a time when we are having trouble. That is what we did after World War II. It was the trade union movement that saved Italy and France and Europe in the dark days, of 1946, 1947, and 1948, when the GCT, the General Confederation of Trade Unions in France, almost had Italy. It was the Federation Union movement at that time headed largely by George Meany and Lane Kirkland, and what the Russian Communists fear more than any other group, Socialists, meaning Social Democrats. There is a vast difference.

I remind my colleagues that difference was brought home in 1922 at the meeting of the second international in Stockholm when the split occurred between two interesting individuals, Ernie Bevin who led the Socialists in the West with a democratic tradition and a guy named Molotov who headed the Communist Russian position which took the view that communism should be brought to power by force.

It was Ernie Bevin who led the group the other way. That is why, when a Russian wants to denounce one of their comrades, they accuse them. Of what? Being a capitalist? No. A Socialist Democrat.

To finalize this little diatribe of mine here, these two men, Molotov and Ernie Bevin, met in the United Nations many years later, it was 1950, over the Korean war, and the Russians were stupid enough to walk out of the Security Council and that is why we still have a U.N. force. But here it was, and you ought to read that debate between Molotov and Ernie Bevin, the trucker who didn't go to college. I don't know if he even finished grade school in England, but he was tough and he was brilliant.

He reminded Molotov of the difference between the Socialists and the Communists.

I mention all of this because we are just missing the boat, failing to understand European history and what really went on and what really gets to these people.

Senator WARNER. I would want to know from the witnesses, has the administration withheld any factual data with respect to the alleged use of the weapons in the nonalined countries?

In other words, if we have, we should know what the reasons are. As Senator Jackson says, it is the judgment of some of us, and I join

him in this, that we have not exploited this very useful international argument to our benefit.

Have we withheld some data?

Dr. GOLD. I don't have the direct responsibility for this, but my impression is that we are making every attempt to try to get as much of this information out to the public as is possible.

Whether the people actually doing that are doing as good a job as they can——

Senator WARNER. That is the basic question. To what extent has that been fractured—part unclassified, part classified?

Dr. GOLD. The intent and instructions that have been given are to get as much of it out as possible.

Senator WARNER. You keep saying as much.

Dr. GOLD. Because I don't know from direct knowledge myself whether there are things——

Senator JACKSON. Mr. Chairman, may I interrupt for one moment?

I do not want to infer that anything is being withheld. I guess what I am trying to say is that there certainly is a great opportunity, a management opportunity, to better take advantage of the raw aspects that we have and forge a program here in which the story can be better exploited and developed for the interest of our friends and allies who do not understand, who do not get the information.

Dr. GOLD. My impression is the story is there in unclassified form.

Senator JACKSON. But there is no real management effort to bring all of these assets together and really exploit it. I merely mentioned the French example because there is an opportunity to get to the raw nerve of the Soviets. France has put them in a terrible position. Here is a Government with Communists in the Government who have taken this action. This is one of the opportunities, Mr. Chairman, that I see where we can take advantage of that development propaganda-wise and in every other way.

No one understands this better than Yuri Andropov because he, of all the Russian leaders, has had more access, although he has not visited in the West other than Eastern Europe; let us say his home reading has revealed to him through his agents the problems that we face in the West and the problems they face.

Dr. GOLD. Budapest was almost the West in 1956.

Senator JACKSON. It almost was during the uprising, but he moved very efficiently in 1956.

Dr. GOLD. I will close by remarking on the frustration that we have with this chemical area because of the emotionalism on this particular item. We have an area where there is probably no greater asymmetry between the Soviet and U.S. forces. We have an area where there is no greater value for the defense dollar, not because we are such efficient managers, but because of the nature of chemical warfare where a little bit of the defense dollar goes a long way.

Our entire 5-year chemical program will cost less than $7 billion most of which to be in the protective sphere. With this program cost, if it includes reestablishing a retaliatory capability, we can build up a deterrent to chemical warfare. There is no other weapon class for which the United States has a more limited policy. It is the only weapon class in our stockpile for which we have a "No First Use" policy. It

is the only class of weapon that the United States has put on the table proposals to eliminate entirely, as stated in our paper in Geneva.

The logic for support for our program appears overwhelming in terms of asymmetry, in capability, what we are getting for our defense dollar, the limited nature of our program, and our forthright and aggressive stance in the arms control arena; in spite of all that it is still very emotional and very controversial.

Senator WARNER. Thank you, Mr. Secretary.

Senator Thurmond.

Senator THURMOND. Thank you very much, Mr. Chairman.

Mr. Chairman, I have a brief statement.

It is a pleasure to have you gentlemen testify today about a subject that is often misunderstood by the public. I sat here during the Second World War when both the Allies' sides and Germans possessed a stockpile of chemical weapons. I am convinced that had the Allies not possessed sufficient quantities of such weapons, Hilter would have used his against us.

The evidence in Afghanistan, Kampuchea, and Laos convinces me that the Soviets are testing the benefits of using such weapons in an offensive manner. When President Nixon stopped production of chemical weapons in 1969, he did so in an effort to get the Soviets to do likewise.

President Nixon's step was a bold stroke of leadership that established the United States as a leader in the effort to rid the world of a terrible form of weapon. At the time, we possessed a sufficient stockpile of weapons that we could rely on for deterrence.

We also assumed, should our efforts to get the Soviets to follow our example fail, we could resume production at a point in time when necessary. The Soviets did not follow our example. Congress has failed to take the action necessary to restore the balance. This poses grave dangers for our Service personnel.

I am convinced we must go forward with chemical weapons.

I have a few questions. If you gentlemen will answer them for the record, it will save time.

Thank you, Mr. Chairman.

Senator WARNER. Thank you very much. We appreciate your participation.

Dr. GOLD. Are we going to go through our threat briefing with Mr. Gasbarri?

Senator WARNER. You may proceed.

STATEMENT OF DOMINIC GASBARRI, DEFENSE INTELLIGENCE AGENCY

[Slide presentation.]

Mr. GASBARRI. This is an intelligence community approved chemical warfare threat briefing.

It is based on intelligence [deleted]. Its strength and thrust derive from the fact that the intelligence community has been following CW developments in the Soviet Union [deleted] and has analyzed numerous [deleted] data.

Thus we have beeen able to observe and document the threat for a significant number of years.

CHEMICAL WARFARE THREAT

The major chemical warfare threat is posed by the Soviet Union and its Warsaw Pact allies. However, an increasing number of countries possess or are acquiring a chemical warfare capability, thereby increasing the prospect that chemical weapons may be encountered in regions of critical interest to the United States outside of Europe.

The Soviets clearly continue to pursue offensive and defensive aspects of chemical warfare and weapons. We see the development and incorporation of state-of-the-art technology that is applicable to chemical warfare, in continuing efforts to acquire state-of-the-art outside the U.S.S.R.

Soviet Chemical Weapons Threat

Soviets pose a viable chemical weapons threat.
Lethal chemical weapons have been used in Afghanistan and Southeast Asia.
Chemical weapons are likely to be used by them in any future conflict.

All efforts are dedicated to insuring survival and operational capability of the Soviet and other Warsaw Pact forces on a toxic battleground. Threat evidence that we have accumulated and analyzed allows us to describe many facets of the Soviet chemical warfare weapons and their potential. [Deleted.]

SOVIET TOXIC CHEMICAL AGENTS

Type agent	Agent name
Persistent:	
Nerve	[Deleted.]
Nerve	
Blister	Mustard.
Blister	[Deleted.]
Blister	
Blister	
Blister	
Nonpersistent:	
Nerve	Sarin.
Blood	Hydrogen cyanide.
Choking	Phosgene.

SOVIET THREAT EVIDENCE

Variety of chemical agents and delivery means:
[Deleted.]
Large chemical troop organization.
Extensive chemical protective equipment.
Large scale decontamination capability.
[Deleted.]
Military doctrine.
History of use.

THE THREAT

Major chemical warfare threat is posed by the Soviet Union and its Warsaw Pact allies.

Increasing number of countries possess or are acquiring a chemical warfare capability.

The prospect of U.S. Forces encountering chemical weapons in regions critical to U.S. interests other than Europe is growing.

BASIS FOR THE THREAT

[Deleted.]

Strength of the threat assessment keyed to all information, but particularly highly credible human sources.

I would like to introduce Capt. Ralph Wade, from the National Photographic Interpretation Center, who will show you some of the latest photography we have [deleted].

STATEMENT OF CAPT. RALPH WADE, NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER

Captain WADE. Good morning, gentlemen.

[Deleted.]

I would like to close with this vugraph.

[Deleted.]

Senator JACKSON. Where in [deleted].

Captain WADE. I am not sure on this particular vugraph.

Senator JACKSON. Have the Soviets turned over any of their chemical weapons to the satellite countries? What is the command and control arrangement? Is it similar to the rule they follow on nuclear devices?

Captain WADE. I would like to turn this over to some other experts.

Dr. Gold, you can help us by indicating which witnesses you think are qualified to make these responses.

Mr. GASBARRI. [Deleted.]

Senator WARNER. The question was, as of today? Was that it?

Senator JACKSON. Yes. Who has command and control?

General WATSON. The Soviets.

Senator JACKSON. [Deleted.]

Mr. GASBARRI. [Deleted.]

Senator JACKSON. It is hard for me to believe, without having any knowledge [deleted].

Mr. GASBARRI. [Deleted.]

Senator JACKSON. Have they been trained? Obviously, they would have to be trained and know how to handle the weapon systems in order to be effective.

Senator WARNER. Have there been any chemical exercises [deleted].

Mr. GASBARRI. [Deleted.]

Senator JACKSON. How about East Germany? This is where the Soviets have 20 divisions. [Deleted.]

Mr. GASBARRI. [Deleted.]

[Deleted.]

Senator JACKSON. Currently. That is true everywhere?

Mr. GASBARRI. Yes.

Senator JACKSON. I would assume that. You are assuming in time of war they might, under appropriate arrangements——

Mr. GASBARRI. [Deleted.]

Senator JACKSON. But they would receive in your judgment in time of war offensive systems? Obviously they would have to be trained offensively because in the field they would be up against the possibility that if they were used, it would apply to them as well [deleted] I assume?

Mr. GASBARRI. Yes, sir. [Deleted.]

Senator WARNER. If you were to run a comparison analysis here—we have seen a number of important pictures—if the Soviets were having a comparable briefing today and they had the [deleted] photography of the United States, how would you quantify what they have in place and what we have in place?

General KLEIN. I would like to address that, sir.

ONSITE INSPECTION

Senator WARNER. The last question I have is on the question of the treaty that we are working on and that is based on what you have indicated what is the likelihood of ever having a successful international agreement that didn't have onsite inspection?

Mr. GASBARRI. I would be giving a personal view on that because I am not involved in negotiations.

Senator WARNER. You would be an adviser to the American negotiation team?

Mr. GASBARRI. You must have onsite inspection. You saw some of the limitations [deleted].

Senator WARNER. Based on your expertise and professionalism in this area, you are saying [deleted].

Mr. GASBARRI. Yes, sir.

Captain WADE. I agree. I do not need to amplify. He covered it with his statement.

Senator JACKSON. How did we [deleted].

[Deleted.] Was that it?

Captain WADE. Yes, sir.

Senator JACKSON. [Deleted.]

Captain WADE. [Deleted.]

Senator JACKSON. This is a classic example then of what you are talking about, of verification. [Deleted.]

Captain WADE. Yes, sir. [Deleted.]

Senator JACKSON. And during World War II?

Captain WADE. Yes, sir.

Senator WARNER. Senator Exon.

CHEMICAL WARFARE

Senator EXON. Would you possibly help me out on a series of questions.

We talk about chemical warfare. Could you elaborate for me in lay terms? In other words, when I think of chemical warfare I think of mustard gas in World War I and what I have read about that. I know there are more sophisticated things.

When you talk of chemical warfare I assume you are talking about a complete array of new chemicals. That is the first question.

Second, what have you turned up about whether or not they have extensive germ warfare which in my opinion fits into the same category?

Third, does your source of information and photography and other things that you have done indicate they have not only the capacity but the intent to use this against civilian populations or is this aimed primarily at military operations and, given that, what was the situation

and how did they react in Afghanistan? Was that the military or civilian population.

Mr. GASBARRI. If I may have the next vugraph just to describe for you what chemical agents are all about.

[Deleted.] You have a range here. You have the blister agents, World War I type agents, and you have the more modern nerve agents.

Now they continue to exploit incapacitating type agents that don't kill; they just knock people out, for example. So you get a whole range.

A Warsaw Pact Commander stated, in the next war they fully expect it to be a toxin-type war. A number of the toxins that have been identified now in all three areas—Afghanistan, Southeast Asia—Kampuchea, and Laos, these have been positively identified through laboratory testing.

[Deleted.]

Now, as far as biological warfare, toxins are covered in the Biological Weapons Convention, but toxins themselves are chemical poisons.

Now, the biological or bacteriological warfare involves the use of germs. This is a different kind of thing. [Deleted.]

[Deleted.]

Now, the usage of these materials, the toxins such as the yellow rain toxins, has been primarily against Mujahaddin tribesmen in Afghanistan and in Laos and in Kampuchea, employed by client states of the Soviets against mountain tribesmen.

You have in effect a guerrilla-type force there, but these are civilians. When they drop the material on the villages they are attacking civilians.

Senator EXON. What delivery vehicles are they usually using? Air drop or artillery?

Mr. GASBARRI. The Soviets have a variety of dissemination systems. In these areas, Afghanistan and Southeast Asia, it has been air drop. In some cases artillery and rocket fire. [Deleted.]

Senator EXON. I have always assumed that germ warfare would not be the ones that would be most effective to use against troops. That is more or less designed, is it not, for civilian populations as opposed to mustard and some of these other new toxic substances that you outlined, more aimed at those who would oppose them in battle or about to oppose them in battle?

Am I correct in that assumption?

Mr. GASBARRI. Yes, sir. If I may expand on your comment.

[Deleted.]

Now, toxins which for general purposes are derived from biological sources have such a short effect time that they become attractive for us in the tactical situation also because many toxins will have effect within an hour or two. For some tactical situations, the employment of a toxin would be useful in the eyes of a particular commander of the Soviets.

So you have these contrasts. Generally speaking, germs are for large area usage against civilian populations. There is nothing that precludes them from being used in a battlefield situation, but you are not going to get an immediate effect.

So, if you think you are going to be overrun by someone——

Senator EXON. You will go to toxins or mustard gas?

Mr. GASBARRI. Yes, sir, or whatever the situation takes.

Senator EXON. You are convinced, and I apologize for being late, but I assume also you are saying that you are convinced from your sources of information, which I suppose are many, that they have substantial quantities of both germ warfare supplies and the mustard, the toxins, battlefield type weapons?

Mr. GASBARRI. In the chemical weapons area, we feel very strongly that they have a large quantity of these weapons.

Senator EXON. How about germ warfare?

GERM OR BIOLOGICAL WEAPONS

Mr. GASBARRI. Germ or biological weapon area is a different matter. You don't have to produce and store them over a long period of time, but they have the facilities that give them a large-scale production capacity in this particular area also.

Senator EXON. These pictures that we have been seeing up here are primarily what I refer to as [deleted] warfare. I like to use germ because I think I understand that.

Senator WARNER. I think we should also say that there is an international treaty that prohibits this biological and germ weapons. He is saying they are doing things in contravention of that treaty; is that correct?

Mr. GASBARRI. Yes, sir.

Senator WARNER. Presumably under the treaty they can't possess any of these things. In fact, we have information classified to the effect that they have facilities in place, perhaps an R&D base?

Mr. GASBARRI. Yes, sir. For germs, if you will, the accident at Sverdlovsk in 1979 went beyond anything, [deleted] went beyond anything that would be allowed by the convention which was research for peaceful purposes.

Senator WARNER. We have repeatedly asked them for information on that incident and they have denied it.

Mr. GASBARRI. Yes, sir, they have stonewalled in effect.

Senator NUNN. In what forum have we made the request for information about that?

Mr. GOLD. Mike MacDonald, from the Policy Section of the State Department, can answer that.

STATEMENT OF MICHAEL MacDONALD, DEPARTMENT OF DEFENSE

Mr. MACDONALD. The Department of State handles it. It does it through desmarches made to the Soviet Union. We have made about [deleted] desmarches and the Soviet response has been an explanation [deleted].

They have attributed Sverdlosvk to a natural outbreak of anthrax from animal sources; namely, bad meat.

Senator NUNN. Have we taken it up with the special consultative commission?

Mr. MACDONALD. I think we [deleted].

Senator WARNER. General Klein?

STATEMENT OF BRIG. GEN. WILLIAM E. KLEIN, U.S. ARMY, ASSISTANT DEPUTY DIRECTOR (FORCE DEVELOPMENT AND STRATEGIC PLANS), ORGANIZATION OF THE JOINT CHIEFS OF STAFF

General KLEIN. In order to shorten the presentation, I would like to have my comments submitted for the record. Then I will summarize.

It is a pleasure for me to be here today to represent General Vessey, the Chairman of the Joint Chiefs, and also the unified and specified commanders.

I think Dr. Gold has adequately covered all the points that I would make. I would say that General Vessey and the unified commanders in particular are on record that in the absence of an effective international agreement to remove the existing and future threats of chemical warfare, that we, in the United States, must acquire and maintain an effective chemical warfare deterrent retaliatory capability.

CHEMICAL DEFENSIVE POSTURE

I heard many comments, Mr. Chairman, on how a purely chemical defensive posture is absolutely inadequate to our overall defense posture. We would agree that it is possible to achieve high protection levels against chemical agents and reduce direct casualty effects, not eliminate them, but reduce them, but protective equipment and procedures, everyone must understand, severely degrade our mission effectiveness.

In fact, the initial user of chemical warfare gains a tremendous advantage if he is the only side who uses chemical warfare or if he doesn't have to be concerned with retaliation. If both sides have a chemical warfare capability, then a potential user is less likely to perceive advantage from chemical use because he might also suffer those casualties or be forced to adopt the protective measures.

Senator WARNER. Restrict your presentation to this closed session and then we will go open.

General KLEIN. Yes, sir.

I won't get into a big discussion of the defensive because I thought it would be useful in the open session to bring in the troops and let you see the protective equipment and we can have a discussion of that at that time rather than go into that now.

I would emphasize, as I said in the opening, that all unified commanders have come on line with the Secretary of Defense and the chairman to make it very clear that they feel that one of their high priority items is for the United States to continue to modernize its chemical stockpile by producing the binary weapons.

I would like to wrap up my remarks and very quickly show you some slides that you have seen before, I believe, when General Gorman spoke to the committee when he talked about the comparison of the NATO and Warsaw Pact conventional forces.

You will recall I talked to you later about the strategic forces. He spoke on conventional. I feel it would be useful if I very quickly reviewed the net assessment and put things in perspective from a very narrow view by focusing on the slides that had to do with the chemical area in that briefing.

21-250 O - 83 - 25

NATO — WARSAW PACT CHEMICAL WARFARE COMPARISON 1982

CAPABILITY	WP/NATO
• PERSONNEL	11 : 1
• DECONTAMINATION EQUIPMENT	25 : 1
• GROUND-BASED DELIVERY SYSTEMS	5 : 1
• TRAINING FACILITIES	11 : 1
• PRODUCTION FACILITIES	14 : 0

This first slide shows an update of the chemical warfare comparison. Here you see the very distinct advantage that the Soviets have in personnel, 11 to 1.

The decontamination equipment—since you saw that slide 3 weeks ago, that has gone up from about, I think, 12 to 1 to 25 to 1. It is a significant increase and I will show you on a later slide why we did that.

You can see in every case that the Soviets looking at us don't see a very strong picture.

CHEMICAL OFFENSIVE/RETALIATORY CAPABILITIES U.S. — USSR 1982

	USSR	U.S.
• TYPES OF AGENTS (#)		
• NERVE	4	2
• BLISTER	6	1
• BLOOD	1	0
• INCAPACITANT	PROBABLE	0
• TOXINS	1+	0
• TYPES OF DELIVERY SYSTEMS		
• AERIAL ROCKETS	PROBABLE	NO
• TACTICAL ROCKETS	YES	NO
• BALLISTIC MISSILES	YES	NO
• MULTIPLE ROCKET LAUNCHERS	YES	NO
• ARTILLERY AND MORTARS	YES	YES
• SPRAY TANKS	YES	YES
• BULK FILL BOMBS	YES	YES*
• CLUSTER BOMBS	YES	NO
• MINES	YES	YES
• PRODUCTION FACILITIES	MANY	0

*U.S. NON-PERSISTENT NERVE ONLY

This slide shows the chemical offensive retaliatory capabilities and makes a comparison of the United States and the Soviets.

Senator NUNN. Is this classified?

General KLEIN. The slide is unclassified. A couple of things I am going to say in just 1 minute are highly classified. I will give exact numbers of battalions and units. But this is unclassified.

You can see, in almost every area we are behind the Soviets. Even in those where we show that we both have the capability, for instance, you can see our long-range capabilities are limited to nonpersistent nerve gas only.

CHEMICAL WARFARE PROTECTIVE CAPABILITIES
U.S. — USSR
1982

	USSR	*U.S.*
• NUMBER OF DEDICATED PERSONNEL	85,000	7,000
• NUMBER OF LARGE, MOBILE, DECON AND RECON DEVICES	20,000-30,000	1,000
• INDIVIDUAL PROTECTION	YES	YES
• COLLECTIVE PROTECTION		
• VEHICLES, SHIPS	YES	FEW
• KEY FACILITIES	YES	FEW
• DETECTION AND WARNING		
• AUTOMATIC ALARMS AND DETECTOR KITS	YES	YES
• RECONNAISSANCE VEHICLES	YES	NO

The last two slides present a comparison of protective capability, how the Soviets compare with us.

I mentioned that we were behind in personnel. I direct your attention to their dedicated chemical personnel, 85,000 to the United States 7,000.

They have in their force structure [deleted].

In comparison, we have a chemical smoke battalion and 18 chemical companies in our force structure.

As I indicated earlier, we have now confirmed an increase in their decontamination vehicles. [Deleted] it has grown from 8,000 to 12,000 in estimation which was the 1982 figure up to, as the captain mentioned to you, over 30,000 vehicles.

Senator WARNER. That is not classified, is it?

General KLEIN. That is not classified.

Senator WARNER. Has that been in the open?

Captain WADE. [Deleted.]

Senator WARNER. I don't know whether this is old or new. There is nothing on here that indicates to me that it is classified.

Is that an unclassified chart or a classified chart?

General KLEIN. It is unclassified.

Senator WARNER. Has that chart been out yet?

Captain WADE. No, sir.

General KLEIN. I will show this, if you desire, in open session.

Dr. GOLD. The new part of that is 20,000 to 30,000 vehicles. We showed a similar chart last year which had 8,000 to 12,000 vehicles.

Senator NUNN. Why don't you state what decon and recon are. I know what it is, but when you get into open session——

General KLEIN. I will do that.

CHEMICAL WARFARE PROTECTIVE CAPABILITIES U.S. — USSR 1982 (CONTINUED)

	USSR	U.S.
• EDUCATION AND TRAINING		
• MILITARY CHEMICAL SCHOOLS	4	1
• LENGTH OF LONGEST COURSE	5 YRS	6 MOS
• CONDUCTS CHEMICAL TRAINING	YES	YES
• FIELD TRAINING AREAS	78	1
• FORMAL TRAINING (HRS/YR)	100-400	16-100
• USE OF LIVE AGENTS	YES	NO
• CW DEFENSE EXERCISES	YES	YES

Of course, the last slide shows you the emphasis that the Soviets place on training their forces.

In closing, I would like to emphasize that in showing this obvious imbalance in protective equipment and also offensive capability, there is no intent to suggest that we should go on a massive offensive build-up nor even to attempt to match the Soviets in all types of their offensive equipment, but rather it is our recommendation that we continue with our modest chemical program to fill what we term a serious void in our capability and send a clear signal to the Soviets that we do not want chemical warfare, but we do have a capability to wage it if we are attacked.

Hopefully, by continuing our program, we deter our would-be aggressor, at the same time give our arms control negotiators in Geneva at the table something to work with.

That concludes my presentation.

Senator WARNER. Now we will hear from General Watson.

Senator NUNN. May I ask one question?

Senator WARNER. Yes.

SOVIET CHEMICAL CAPABILITY

Senator NUNN. Has the intelligence community or DIA done an analysis of what drives the Soviet forces to a strong chemical capability?

Is it based on paranoia growing out of experiences in World Wars I and II? Do they try to exploit it in terms of intimidation?

Do you have any sign that they really are trying to intimidate people with this kind of capability?

Do they exercise it in a way that they want us to know what they are doing or are they trying to hide it?

It seems to me motivation here, although it is hard to measure, is awfully important.

Mr. GASBARRI. A lot of this traces back to World War I when they took more casualties than any other country from chemical weapons. They followed with military chemical academies back in the early twenties.

They started at Shikhany Proving Ground in the late twenties. What they do seem to have is paranoia about being able to survive and operate on a toxic battlefield because they fully expect the next war is going to be one wherein the Soviets themselves or their adversaries will use chemical weapons.

Now they brag about their protective posture and their chemical troops organization, but what they keep quiet about is the agents that they will use that they have in their inventory and their plans for employment.

[Deleted.]

In the area of protection and defense they brag about their capability in this area. Whether they see this as an intimidation, we don't know at this point, but they are fully, we would say, paranoid in the defense area and recognize what the potential of chemical weapons is in a particular battlefield situation.

Senator NUNN. How would you compare their chemical defensive capability now to what they had in World War II?

Mr. GASBARRI. A marked improvement in the size of the troop organization and the facilities for training.

Senator NUNN. In terms of emphasis or in terms of qualitative? Do they emphasize it a lot more?

Do they have a lot more people involved in it or have they simply modernized and upgraded the quality of their equipment?

Mr. GASBARRI. As technology evolves, they go for the state of the art.

Senator NUNN. Did they have a strong chemical defensive emphasis in World War II?

Mr. GASBARRI. Not as strong as today, sir, no. At that time basically chemical troops were just smoke control battalion type troops.

The emphasis has switched significantly. You can see it by the increase in vehicles and so forth.

Senator NUNN. Their World War I experience was that Germany used it against them?

Mr. GASBARRI. Yes, they took 475,000 casualties then, 56,000 deaths. According to the historical archives, they took more casualties and deaths than any other nation.

Senator NUNN. It seems to me that needs to be part of the story. That does not excuse their offensive behavior, but I do believe that is a key element here, particularly if we ever hope to get some agreement from them.

They have fought the Germans twice and in one of those wars they have suffered more than we have. I don't know how many casualties

we took in World War I and II, but their chemical casualties seem to have exceeded that of any other country.

Dr. GOLD. The treaty we are talking about would allow them to keep their massive defensive capabilities, keep their 85,000-man corps, keep their tremendous chemical force structure with which they are obviously so enamored, so long as we have a verified means of insuring they don't have chemical weapons.

Senator NUNN. I just think history is so important. Senator Jackson was just relating history here. I think if we are going to have an understanding about where they are coming from, you have to look at this historically.

SOVIET WORLD WAR I CHEMICAL CASUALTIES

General WATSON. Senator, let me comment on your question for a moment and talk about the Soviets.

I do think that Mr. Gasbarri is right in saying that the origin of the chemical capability of the Soviet Union dates back to World War I in which they did suffer 435,000 casualties of which 56,000 of them were deaths. That is a conservative estimate according to some Russian documents.

But, as we see the Soviet second echelon doctrine emerge, we begin to see in the Soviet Union great dependency upon surprise and rapid movement and overpowering offensive capability. The chemical warfare program has given them the means with which they can gain rapid deployment, rapid movement and it also gives them the capability to exploit any breakthrough successes they may have.

That is one of the reasons why they have such a huge defensive capability.

Senator WARNER. I don't want to interrupt you, but, Senator Nunn, this is so important to our establishing a case, I would like to urge that this go in the open part of the record for those who want to examine it and it would be usable by us in debate.

If there are any classified responses to the Senator's question, we can cover them now and then reopen this issue once again in our open session.

Senator NUNN. My problem is that I have to go to a naval strategy meeting.

Senator WARNER. I will repeat the question in your behalf in the open session.

General WATSON. Let me conclude quickly then, sir, in the interest of your time to say that the 85,000 Soviet chemical troops and the command and control structure for that, and how they are distributed throughout the Soviet Army, coupled with the fact that they have positive pressure in their vehicles and in all of their crew carrying systems allowing them to seek the momentum, exploit that momentum, decontaminate themselves quickly, both their equipment and their people [deleted] and move forward.

It is very much an integral part of their capability.

Senator NUNN. Defensive in this area has a strong offensive overtone.

General WATSON. It is a way they achieve offensive capability.

Senator NUNN. If you are going to use it, you have to be able to operate in that environment.

General WATSON. That is why they have that kind of capability. It is not to defend the motherland. It is to keep the offensive army on the move.

Senator NUNN. I think the two are not exclusive. One side says they are paranoid. The other side says they are imperialistic. I don't think they are exclusive. I think you can be both.

Senator WARNER. Have you finished your questions, Senator Nunn?

Senator NUNN. Yes.

Senator WARNER. We will now proceed to General Baker and then Admiral Barth and then wrap up with General Watson.

Again, General, if you will confine yourself to the classified portion so that we can have as much as possible in unclassified record.

STATEMENT OF BRIG. GEN. THOMAS A. BAKER, U.S. AIR FORCE, DEPUTY DIRECTOR OF OPERATIONS

General BAKER. Thank you, Mr. Chairman.

I appreciate the need for brevity here. I will attempt to go through this quickly.

It is a pleasure for the Air Force to have an opportunity to present our position on chemical warfare.

The objective of the Air Force chemical warfare defense program is to develop equipment and provide training to insure survivability of our forces. In this program to date we have fielded near-term air crew and ground crew protection ensembles, detention equipment, individual decontamination kits.

Our positive productive initiative to date has been an intensive training program in which we emphasize the performance of wartime tasks.

Senator WARNER. General, this is unclassified?

General BAKER. Yes, sir.

Senator WARNER. If you can restrict yourself to the classified portion, we will give you adequate opportunity in the open hearing.

General BAKER. I will make two quick points, sir.

On the defensive side we have one acute deficiency which we would like to surpass. That is our lack of collective protection facilities. With our current chemical ensemble we have a [deleted] capability to fight in a chemical environment. The limitation is that suit. In other words, we must come out of that suit after that [deleted] period.

Presently we have no place to go except off the facility without some collective protection facility in which we can put groups of people. This is a deficiency which we are attempting to solve with the development of survivable collective protective systems. This slide represents an example of this system.

We are assuming that this design is effective, and so forth, we will be able to fund it and deploy it in both Europe and Korea.

Obviously, the other deficiencies are in our retaliatory capability. You have seen some slides already and I won't be redundant to tell you what that deficiency is in terms of its usefulness other than to say from a tactical viewpoint the current stockpile is not compatible with today's battlefield.

Obviously, with those weapons filled with a nonpersistent agent we risk a very expensive asset in our aircraft for a very low return on the battlefield.

In the case of the spray tanks we must deliver that directly over the target. In addition, the spray contaminates the aircraft itself. So, upon return from that kind of mission we have to go through a rather lengthy decontamination process on the aircraft.

Thus we come down to the Bigeye. We see that as the near-term fix for that problem. It has a number of characteristics that are desirable for us in addition to allowing us to deliver from longer ranges. It has great coverage and it has a storage safety factor which makes it very easy to handle.

In short, Bigeye provides coverage persistence and survivability that we need in our inventory. Our requirement for Bigeye is [deleted] weapons. That has been defined by the fighting CINC's and we are requesting funds for this [deleted].

Thank you.

Senator WARNER. Thank you very much.

Admiral.

STATEMENT OF REAR ADM. JOSEPH J. BARTH, U.S. NAVY, DIRECTOR, STRIKE AND AMPHIBIOUS WARFARE

Admiral BARTH. I will summarize my remarks.

Today in the Navy our ships with the exception of submarines are only marginally capable of fighting and surviving in chemical warfare. As a result of that we are proceeding vigorously with our efforts to obtain protective devices. We are outfitting our sailors with the required suits and masks and trying to get detection equipment for our ships.

Even when we have that, the Navy probably of all the services is more constrained in our ability to fight because of the high stress of the heat environment in our engine rooms and fire rooms and the kind of operations that we do on our ships in addition to the fact that we are confined to the ships and we can't get away from the persistent chemicals.

More than anybody else we are very interested in seeing a retaliatory capability being developed as a deterrent and we feel very strongly that this is essential to our ability to engage in combat with the Soviet Union.

Senator WARNER. Admiral, it is my understanding—you used the words "We are vigorously pursuing"—that there was a decision made that the Navy would try to equip ships, current ships, for a CW environment.

Am I mistaken on that?

Admiral BARTH. Yes, sir. The difficulty is with some of the ships that are currently under construction. We are vigorously pursuing the new construction ships as they come along, but for the ships we have under construction now the cost of doing that is excessive.

Senator WARNER. We are at a breakpoint in the Navy construction program and it is in the future that we will be designing our ships to operate in the CW atmosphere; the existing fleet and those under construction now will not?

Admiral BARTH. Yes, sir, in terms of collective protection.

[The prepared statement of Admiral Barth is as follows:]

PREPARED STATEMENT OF REAR ADM. JOSEPH J. BARTH, DIRECTOR, STRIKE AND AMPHIBIOUS WARFARE DIVISION

Mr. Chairman, gentlemen: I am Rear Adm. Joseph Barth, Director, Strike and Amphibious Warfare Division in the Office of the Chief of Naval Operations. I appreciate the opportunity to appear before this subcommittee to present an assessment of chemical warfare in the U.S. Navy.

First, I will address the Navy's chemical warfare defensive posture and then I will discuss the Navy's offensive chemical capabilities.

Today, with the exception of submarines, our ships have only a moderate capability to "survive" a chemical attack. Moreover our ability to continue combat operations in a chemically contaminated environment is marginal. For example, we would find it very difficult to conduct carrier air, mine countermeasure or amphibious operations from contaminated ships.

To be able to operate effectively in a toxic environment, we must be able to detect the chemical agents before they contaminate our ships, provide individual protection for our personnel, and be able to close up those ships to form a protective envelope as well as be able to decontaminate after a chemical attack. We are pursuing an ongoing program to improve our defensive posture. We have begun to equip our ships with long range detection and early warning devices. The first two zone prototype collective protective system or citadel is being installed in an amphibious assault ship (LHA) in fiscal year 1983. Based on the results of this prototype system we intend to further expand collective protection systems, with a goal of installing systems in all new ships commencing in [deleted] as to procurement of defensive chemical equipment, we are concentrating on providing items of equipment, such as masks and clothing, detectors, decontaminants, and antidotes for afloat forces with first priority being given to highly vulnerable amphibious units.

Chemical protective equipment in itself detracts from our ability to conduct combat operations. The encumbrance of the protective gloves and mask reduce manual dexterity and field of vision. Furthermore, the protective garment insulates the body and increases the probability of heat related casualties. This problem is especially acute in the high stress of combat operations and in hot areas aboard ship such as enginerooms and firerooms. An effective defensive posture alone is therefore, not sufficient to insure our ability to operate at maximum efficiency in a chemical environment. Increased defensive readiness must be complemented with an effective deterrent to discourage an aggressor's first use of chemical weapons. Mr. Chairman, the Navy offensive chemical warfare program is intended to provide such a deterrent.

As you are aware, our current chemical munitions are principally air delivered Weteye bombs containing a unitary chemical agent. [Deleted.]

In that the objective of the U.S. chemical warfare posture is deterrence, the Navy has been involved in the development of a better weapon—the Bigeye binary chemical bomb. A binary weapon generates a persistent agent from two nonlethal chemicals hence the name "binary." Although they are not more lethal than unitary weapons, we believe that binary munitions are the most sensible way to establish a realistic deterrent because of their obvious advantages over the current unitary weapons in terms of safety, security, transportability, and deployment.

The Bigeye program is a joint Navy-Air Force program, with the Navy designated the lead development service. The development is coordinated with the Army, the executive agency for Department of Defense chemical warfare research and development, and the single manager for production of this ammunition.

In summary, Mr. Chairman, today the Navy is marginally ready to counter the Soviet's use of chemical weapons. Our chemical defense capability is improving but still limited due to equipment shortfalls and technological deficiencies. To rectify this, we are continuing to pursue an active program to enhance chemical defense within program and budget constraints. Offensively, we lack the modern munitions necessary to present a credible deterrent to the Soviet's first use of chemical weapons. We firmly support the chemical warfare modernization program and are working to provide a force capable of deterring the

Soviet use of chemical weapons and view the production of the Bigeye weapon as the first necessary step towards this goal.

Senator WARNER. Is there anything further from this panel of witnesses in closed hearing?

General Watson, we will have a wrapup by you if you feel there is some classified material you want to add.

General WATSON. Yes, sir, Mr. Chairman, I have classified material that I think is important that I discuss.

Sir, the Army deeply appreciates the support that has been given to us on this issue by you and your committee. Most of the things that I wanted to talk about in a traditional sense on the part of the Army have been discussed so I have geared this presentation to talk really, Mr. Chairman, about two things that I think are important to the Army.

The other services have mentioned many of the things that are also important to the Army, but I want to isolate a couple of issues.

First of all——

Senator WARNER. Remember, we are only classified at this point.

General WATSON. Yes.

Senator WARNER. I can't stress too strongly that to win your battle on the floor of the Senate we have to have this open.

General WATSON. I understand. But this particular one I cannot, sir.

Senator WARNER. I understand that.

General WATSON. Because it does show our very fragile vulnerability. That is why I wanted you to hear it in closed session.

We looked at two things. We looked at what this capability does to the combat capability of the Army. That is the part I want to share with you.

Second, I would like to go back and address again, looking at a tactical scenario, what the current capability of the Army will do to our ability to deter and show you those inadequacies in a tactical sense.

[Chart presentation.]

General WATSON. The Soviet doctrine is very well interlaced throughout all of its services. They combine all of their capabilities into a single offensive army.

The Soviet capability, sir, that you have described looking on a battlefield extends all the way from the front to a depth of 400 to 500 kilometers. I want to show you now how that applies to one division.

[Chart deleted.]

We conducted, Mr. Chairman, a battle game at Fort Leavenworth. It took approximately [deleted].

I want to share with you the results of that effort. [Deleted.] We elevated the time forward to February 1986 so that we could take advantage of the new force structure coming into the Army.

We do not have, as Mr. Gasbarri and Captain Wade indicated to you, [deleted]. We had to revert back to their doctrine, sir, and shown on this chart is doctrinely what they say they will be in chemical capability.

I point out that across their entire inventory [deleted].

Sir, in the [deleted] period I want to share with you here just [deleted] of that battle. Then I will roll up the results.

[Chart deleted.]

This particular vugraph shows the [deleted].

We have conducted this battle showing all of the forces, but I pulled off all of them except the tank units of [deleted].

Soviet doctrine says they will attack this force with [deleted].

[Chart deleted.]

This shows in a [deleted] period the firing missions that were fired by the Soviet Union using their doctrine and their capability.

The little envelopes you see, Mr. Chairman, represent the downwind distances that the chemical agent clouds would travel and [deleted].

Our doctrine says that when [deleted] we go into full protective clothing. It is at that point that the degradation on our force starts to occur. [Deleted] fire mission.

This is the result of the [deleted]. This particular fire mission in the [deleted] period I am describing resulted in one tank company being hit directly with [deleted] and two tank companies being hit with [deleted] agent on the tank flank near [deleted].

[Chart deleted.]

This is from the [deleted]. The Soviets have this capability. There were rounds fired by one battalion for a total of [deleted] that they shot at a particular tank unit.

The large downwind distance created by this is the result of [deleted] of agent being placed in [deleted] on a tank company. That represents a distance of about [deleted] kilometers, that is the distance that the gas cloud would travel and [deleted].

If you look at the lethal area, the lethal part is only about a fourth of the entire distance.

The Soviet doctrine calls for them to try to get at least [deleted] percent casualties on each unprotected target that they fire at. That is the reason why they fire [deleted] in one fire mission at a tank unit.

[Chart deleted.]

Now, this is their favorite chemical delivery system, the [deleted]. This particular battalion can fire [deleted] of agent that they can deliver on a tank company in [deleted].

The downwind distance you see here in one of these attacks represents about [deleted] kilometers, the lethal portion again in this area here.

When I look at the green, the blue and the red, [deleted] let me just highlight how many. There were 23 tank companies in the [deleted] on line. [Deleted] of them were hit directly with the [deleted] from the [deleted], [deleted] of them from the [deleted] of them from the [deleted]. A total, sir, of [deleted] of the 23 companies were hit either directly or indirectly from [deleted] of combat with the Soviet Union and in those [deleted] companies they would have to go into full MOPP.

Where we operate in temperatures, 70 and 75 degrees and higher, [deleted] they would start to lose their combat efficiency. If they stayed in their vehicles for [deleted] which I doubt very seriously they could do it because our documents and our tests show at 75 to 80 degrees they could probably stay in there [deleted] after [deleted] the capability of the entire force of the U.S. Army would be lost if they had to go into full MOPP, sir.

That is the degrading part. That is why the defense only approach is not very favorable to us even though we protect the soldier's life, we probably would lose him because he would become fatigued and ineffective.

Senator WARNER. To counterforce using conventional weapons?

General WATSON. To counterforce using conventional weapons. This gives the Soviets great momentum in their offensive as they move

through because their systems have positive pressure, their armored personnel carriers, and their tanks, and their other troop carriers, and they could move up and engage in this battle in their compartmented vehicles without having to go into full protective clothing.

If they do have to go outside in this environment and they put on their protective clothing, it is really more degrading than our own, the difference being that they have enough decontamination capability that within 1 to 4 hours they have completely cleaned themselves up and down-dressed to battle.

Senator WARNER. How quickly is the battlefield itself opened to conventional type ability?

General WATSON. The conventional fires are going on at the same time as their use of chemical systems. They have enough artillery in their force structure that they can deliver this and still continue to fire conventional weapons at targets of opportunity.

Senator WARNER. Then how soon from the standpoint of degradation of the chemicals is the battlefield then transformed—I don't know what the phrase is, a nontoxic environment?

General WATSON. The cloud with a nonpersistent agent would probably last only several hours, sir. [Deleted.]

If they use the thickened GD or the mustard, that part could last for several days, sir.

Senator WARNER. I would like to interject a personal note. My father was in World War I as a doctor. As a young man he told me stories about the trench warfare and the gas attacks. He indelibly impressed on my mind when the attacks occurred discipline totally broke down.

Is that factored in here? I don't mean to be disrespectful to our command structure and troops, but we have no way of conducting exercises under this type of environment to know what would happen psychologically to our troops.

General WATSON. We don't do a good job at this.

Senator WARNER. What do you mean?

General WATSON. For training in psychological stress we only subject our soldiers to tear gas, but certainly psychological stress will be a major part of chemical warfare.

The Soviet doctrine says they will inflict [deleted] percent casualties on unprotected troops. They go for that, but if a soldier has a mask, the Soviets will only expect [deleted] percent. A large part of that [deleted] percent is because of the panic they can create and because the soldier may not be trained well enough to put on his protective gear that he is issued in time. So it is very much a part of their doctrine and they are very much aware of it.

Senator WARNER. Those statistics, [deleted] relate to the Soviets, or how they treat us?

General WATSON. That is how they would treat us. In order to reduce their psychological stress, we have numerous reports where they actually maneuver through diluted agents and we have reports of where some of their officers and their men have been killed as a result of exposure. But they are very much aware of the psychological stress and they maneuver through live agent training in order to reduce that psychological deficiency.

Senator WARNER. That is classified?

General WATSON. No, sir, it is not.

Senator WARNER. Would you bring that out in the open record.

General WATSON. Yes, sir.

I want to get away from the [deleted] and go back to the [deleted] and give you the effect over the entire corps.

In this scenario I have only talked of the divisions. We had three divisions in this corps. I want to show you what happened to the total corps.

Within the total corps we had 225 size units that were attacked with a nonpersistent agent.

Incidentally, there were 700 companies in the corps. [Deleted] of them were attacked with nonpersistent, [deleted] shown here, with persistent agent. If you talk about a decontamination mission, look at the number of units that would have to be decontaminated. When you look at one U.S. company—it takes us anywhere from [deleted] to decontaminate that one company—you see what kind of decontamination load we have created for ourselves.

What this says is that we are not going to get out of those protective garments very fast and the degradation is going to continue.

[Deleted] attacks that they were able to fire in that corps area in a [deleted] period. [Deleted] of them hit our units and produced casualties.

Here are the casualties, sir. We had in the corps over [deleted] casualties. We were only able with our retaliatory capability, because it was limited to artillery, to inflict upon them [deleted] casualties.

We were able to fire at them [deleted] rounds. They fired at us [deleted] rounds in that [deleted] period.

I want to skip through some of my unclassified material, sir. I want to switch the conversation, Mr. Chairman, and talk to you about what our capability does to them in tactical terms.

Senator WARNER. Back to your first scenario, can you quantify the percentages of your corps in that period of the [deleted] framework, what percentage of the corps took casualties?

General WATSON. About [deleted] percent of the units took casualties, sir.

Senator WARNER. That is number of units. I am trying to figure out what is left of that corps in terms of fighting capability after [deleted].

General WATSON. Let me go back to the last chart.

[Deleted] casualties out of a corps that probably about [deleted] total strength, sir. You are talking [deleted] percent of the corps became casualties in a [deleted] period.

General KLEIN. When you look at that you have to realize that the corps units that were hit were your combat units. The [deleted] takes in a lot of your combat support services. So you took [deleted] percent of your combat fighting strength.

General WATSON. We had [deleted] on line, sir.

Senator WARNER. [Deleted] in reserve?

General WATSON. [Deleted] in reserve. I would say [deleted] percent of the casualties that you see here came from those [deleted] divisions, [deleted] each out of a strength of [deleted].

Senator WARNER. At some point in time in this analysis you have to impress on us what is left of that corps in terms of fighting capability, unit integrity, how efficient it is to continue the battle.

General WATSON. It would be very difficult after [deleted] hours to continue under these circumstances, sir.

Senator WARNER. Are we beaten?

General WATSON. [Deleted.]

All modeling we do shows a [deleted] beginning at the point that the soldier becomes fatigued.

Senator WARNER. At that point we have to begin a withdrawal action as an army?

General WATSON. Yes. Now I want to emphasize that this particular line, sir, only isolates those casualties created by chemicals. It does not cover the casualties created by nuclear or other conventional systems.

Senator WARNER. I would think his conventional counterforce would be far more effective against disoriented, disorganized units than under normal battlefield conditions.

General WATSON. There is no doubt about it, sir.

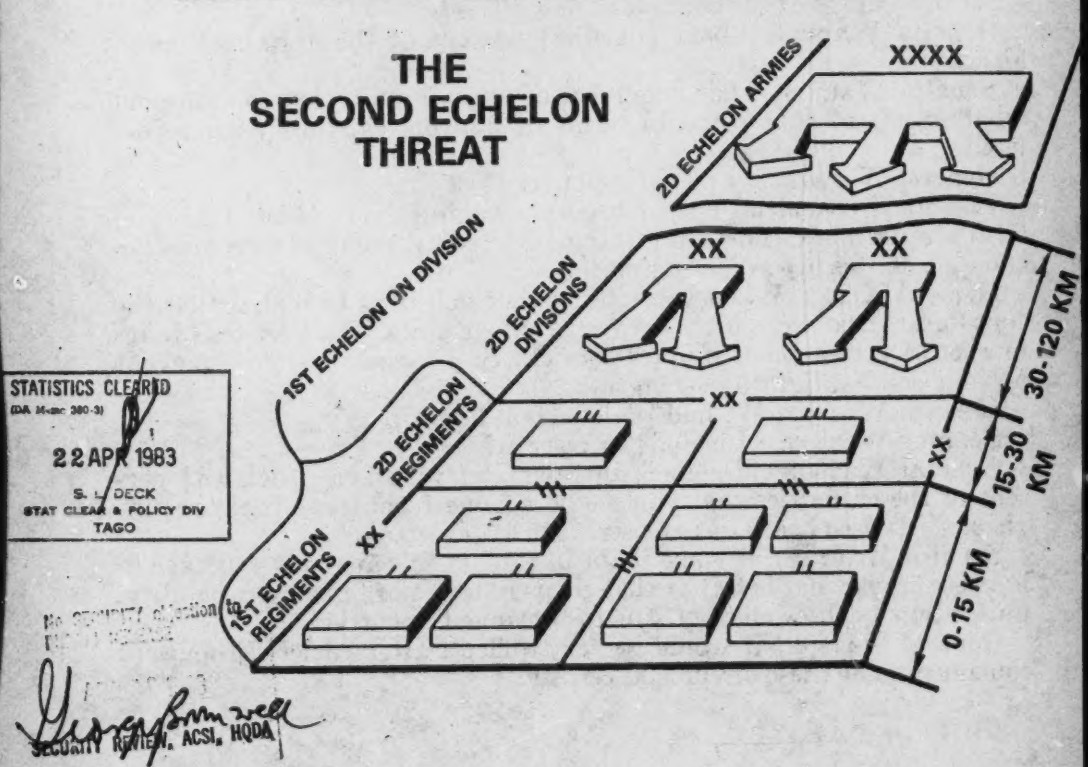
Senator WARNER. The force multiplier effect?

General WATSON. Force multiplier effect, clearly. The Soviets recognize the force multiplier effect of chemicals more than any other army. I think that is very much the reason why it is a part of their capability, sir.

I want to switch now and show you what we can do to them.

Sir, this is a rather stylized chart. It shows the Soviet Army deployed, the first echelon being here, the second echelon there.

CURRENT US CW RETALIATORY CAPABILITY
(ARTILLERY MUNITIONS)



STATISTICS CLEARED
(DA Memo 380-3)
22 APR 1983
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TAGO

No SECURITY objection to [illegible]

SECURITY REVIEW, ACSI, HQDA

In the first echelon we have the first echelon divisions and the second echelon divisions here. I know that it is stylized, but I want to make a point.

If we take our entire ground artillery delivery capability, we have the ability today to shoot [deleted]. That would extend into the Soviet territory across the front line about [deleted]. Only the units you see engaged would we be able to take under fire. The rest of the units would be able to move freely throughout the battlefield except for what the Air Force could do with their bombing capability and that [deleted].

From this point, sir, [deleted], all the way to the depth of the battlefield we have [deleted].

Let us look at where their targets are. Forty-five percent of the Soviet divisions are deployed in the first 30 kilometers from the battlefield. When we look at the Howitzer ammunition we have today we have [deleted] capability in the current inventory to engage the targets that present themselves [deleted].

We have nothing to engage them beyond [deleted] I spoke of earlier.

If we modernize with the 155-millimeter binary round, that will eventually give us a capability [deleted].

In summary, these are the requirements that we need for deterrence. Again, I can't overemphasize the need for a strong retaliatory posture to keep that awesome offensive capability from folding in on us.

I only put this up to show that in 1919, General Pershing in his address to the Congress made this statement:

> Whether or not gas will be employed in future wars is a matter of conjecture, but the effect is so deadly to the unprepared that we can never afford to neglect the question.

Senator WARNER. Like everything else here in the halls of the Congress, we rush, rush or do nothing. We should have asked some World War I veterans to come in here and sit down and tell us what actually happened. One of these days I am going to do that in a hearing. General Fulwyler and I started, but we never finished. There must be some fellows around that can come in here and portray these things in dramatic terms.

General WATSON. I am an honorary member of the 1st Gas Regiment. There are 46 of the gentlemen left from the 1st Gas Regiment. They are going to have their 65th anniversary this summer at Fort McClellan.

I have talked extensively with that group of people. There is one thing that comes up out of all of the conversations. They will tell you that the only way they were able to keep the Germans in World War I from firing mustard at them was to shoot it back.

Senator WARNER. No doubt about that.

You know, underlying this, and I will try to bring it out in the open hearing, it is not fair to the young men and women and families that we are sending over to the NATO environment not to be prepared. Winning the war is our first goal, but second we have to protect these people.

General WATSON. Thank you, Mr. Chairman.

Senator WARNER. Thank you very much for a good presentation.

We will now recess for about 4 minutes and then resume.

[Whereupon, at 10:53 a.m., the subcommittee proceeded in open session.]

OPEN SESSION

Senator WARNER. We are now in open session. At this time we welcome the distinguished Congressman from Arkansas, Hon. Ed Bethune who has requested the opportunity to testify before the subcommittee. We look forward to having his thoughtful and articulate comments as a part of our record on chemical preparedness matters.

STATEMENT OF HON. ED BETHUNE, A U.S. CONGRESSMAN FROM THE STATE OF ARKANSAS

Mr. BETHUNE. Thank you, Mr. Chairman.

I appreciate the opportunity to be with you during this testimony and to have been with you earlier during the closed session.

Like you, I have taken a lot of heat for my support of most of President Reagan's defense budget. I have always taken some heat for my support of the Warner-Jackson model on the freeze issue in the House of Representatives.

In my view, however, an important matter has been ignored in the debate on the nuclear freeze and disarmament generally and that is the freeze we have had on chemical weapons for the past 14 years.

Not only has this freeze gone ignored in the nuclear, it has been ignored in the struggle ongoing now for the hearts and minds of the people worldwide who see the Soviet Union and the United States as partners in crime in this never ending battle to gain nuclear superiority.

I think that is regrettable because there is a distinction between the United States and the U.S.S.R. when it comes to chemical weapons. We have a real opportunity to drive that point home and gain some badly needed trust for this administration and for U.S. arms control policy. The question is, I believe, whether or not we are going to take advantage of the opportunity that we have.

On February 4 of this year Vice President Bush visited the Committee on Disarmament in Geneva to present a new U.S. initiative on chemical weapons. Shortly after that, I spent a week in Geneva with Ambassador Louis Fields and our negotiating team.

I can tell you without equivocation that the U.S. initiative generated a lot of goodwill among our allies. I was told time and time again by the non-alliance countries as well as our allies that we have a chance for a chemical weapons treaty at the Committee on Disarmament. This is in stark contrast to the information that was received on the Hill just yesterday with respect to the other negotiations that are underway.

TREATY ON CHEMICAL WEAPONS

Unfortunately, with respect to the negotiations for a treaty on chemical weapons, there is a fly in the ointment. At the same time that we are asking for a chemical weapons treaty, a request has been made by the administration to start production of the binary chemical

weapons. Because of that, we face the same allegations, contradictory words, and deeds as has been the case from the START negotiations.

Accordingly, I believe we give our detractors a boost and we virtually assure that support for the chemical weapons initiative will dissipate just as the support for the START and INF initiatives seem to be dissipating. It does not have to be that way in the case of chemical weapons.

While we have, in my judgment, no choice, but to build up, or at least modernize, our nuclear weapons, chemical weapons are different. For many reasons, some historical and some logical, we don't have to commit to a buildup or modernization of chemical weapons right now.

Chemical weapons, by their very nature, are tactical weapons, not strategic weapons. Commanders don't like to use the weapons because they degrade combat efficiency on both sides of the battlefield.

The object, therefore, is to have a sufficient deterrence so as to cause the enemy to suit up and labor under the same disadvantage that he has created by the use of chemical weapons.

The question of deterrence is necessarily interlocked with the inability of a force to respond in other ways and thus it is more difficult to analyze what is needed as to deterrent at any particular time.

That is why, I suppose, that chemical weapons have never been used by a superior force against another superior force except during World War I when it was learned that both sides lose by the use of chemical weapons.

Of course, it is a different story when a superior force is up against a primitive force and the weapons can be used effectively by the superior force with impunity and without fear of retaliation.

Much more could be said about the logical differences between chemical weapons and nuclear weapons, but for the purpose I have here, a paragraph of history is worth volumes of logic.

In 1969, President Nixon set a policy for this country which, over time, has worked out to be that we will not produce or use chemical weapons. Since that time, we have held firmly to what is in effect a unilateral freeze on chemical weapons. Even though there was a recent request for production of binary nerve gas weapons by the administration, it was denied by the Congress. Thus, the Nixon freeze on chemical weapons is still the policy of the United States.

There was a strong vote in the House of Representatives on my amendment against the production of nerve gas, the new binary weapon. The vote was 251 to 159. That was during the last Congress.

We have a different mix in the House of Representatives now, as you know, and I suspect that the opposition to binary weapons is stronger in this session than the last.

I don't believe the House will reverse its position because the Members intuitively sense that the 1969 policy gives us a special opportunity to contrast American policy and practice with that of the Soviet Union.

When the budget fights are all over this year, even many liberals, in spite of their clamor for a freeze, will be voting for an increase in military spending. There is a little hypocrisy there, I think. Thus, it will appear correctly to people around the world that the Soviets are spending more on military hardware, but it will also appear correctly that the United States is doing the same thing.

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The problem is this: The people, I believe, common, ordinary people all around the world, feel that the superpowers, the United States and the Soviet Union are particeps crimini in the nuclear arms race because we are both building. It is a question of degree, and the politics of confusion prevails.

It is practically impossible to distinguish ourselves from the Soviet Union in the case of nuclear weapons for that reason. Therefore, it is extremely difficult to gain the high ground in the battle for the hearts and minds of the people around the world.

Given the fact that the Soviets are so willing to practice the politics of confusion and since they are so good at it, the chance to win a clear victory for the hearts and minds of the people of the world and the masses is reduced to nil for the United States. I think that is the reason why there is pessimism surrounding those ongoing discussions.

That is not the case with chemical weapons. The American policy since 1969 is as pure as the driven snow. For neaarly 15 years, we have neither produced nor used chemical weapons. When that is contrasted with Soviet policy and practice, we win the high ground hands down. It is no contest, Senator.

RUSSIAN USE OF CHEMICAL WEAPONS

I believe the inertia of the Nixon policy in 1969 and the allegations that the Russians are using chemical weapons in Afghanistan and other places throughout Southeast Asia serve us well for the moment and will carry the Bush proposal for a while longer. But by and by, their steadfast denials, and insistence by some that the United States should start production of binary weapons will eventually erode the proposal that Vice President Bush presented.

At the moment, however, there is the optimism that I mentioned at the Committee on Disarmament in Geneva. When that is coupled with the fact that members are hungry for achievement, it is apparent that we have a narrow window where we can gain the offensive.

Specifically, I believe we should get the fly out of the ointment by pulling back the request to produce binary nerve gas weapons. We, and particularly the administration, should restate the 1969 policy against production and use established by President Nixon.

We should speak proudly of our record since that time and express our concern that the CW freeze which we employed nearly 15 years ago has put us behind the Soviets.

We should point out that, even though the Soviets are producing and using chemical weapons, that we are people of hope and we do not want to hastily abandon a longstanding policy that has served us well.

BIOLOGICAL WEAPONS CONVENTION

When we look at the biological weapons conventions, we can see that the policy has worked in the past. On November 25, 1969, President Nixon announced that the United States renounced biological warfare and would destroy our stockpile of biological weapons and would restrict future research to only defensive measures.

On February 14, 1970, the President's renunciation was extended to toxin weapons. The Soviets did not agree to this until April 10, 1972.

In effect, therefore, the United States made the decision to unilaterally renounce and destroy biological and toxin weapons before we had

a treaty, but then we did get one in 1972. Ironically, the sticking point with the Soviets was that they wanted both chemical and biological disarmament considered in the same treaty because they wanted to make much out of the United States use of defoliants in Vietnam.

I say that is ironic because the point I am making here today is that this same technique can be used against the Soviets now. We can make much of their practice and their policy; we can make more of it when it is contrasted with our existing policy if we don't, in my judgment, lose the purity of our existing policy by commencing the production.

In any case, when Ambassador Fields presented the U.S. detailed views paper on chemical weapons, he stated that we are not seeking absolute verification:

> We recognize that some risks will have to be accepted. However, we do insist that these risks be minimized in order to safeguard our security and that of all other countries.

LEVEL OF VERIFICATION

We must have a level of verification that meets that objective. In other words, I believe we have a chance to correct the problems of verification.

I did have a chance while I was in Geneva to visit with the Soviet Ambassador, Mr. Issraelyan. The Soviets say they want an agreement. So let us see how serious they are. They have indicated that they will have flexibility on verification.

Well, let us see how flexible they are. Obviously we can't hold on to our CW freeze and the 1969 policy ad infinitum. We have held it now for 14 years. But we should be and I think we will be willing to take some risk because we want peace and because we are trying to do the right thing.

I believe we have a credible deterrent at this moment. We have enough in our arsenal to force them to suit up, and as I put it to all of the delegates at the Committee on Disarmament as I made the rounds, it comes down to this.

My feeling, and I think the feeling of most Members who voted with me in opposition to the new production in the House of Representatives, is that there is an opportunity to get a treaty. The circumstances are different.

I don't know why we have not gotten one in the past, but I think the conditions and circumstances are right so that we can make some headway in the next year.

CHEMICAL WARFARE TREATY FORTHCOMING

I believe that Members of the House will agree with me that if there is no evidence that a treaty is forthcoming at the Committee on Disarmament, it would be irresponsible to continue ad infinitum to hold to the 1969 policy.

Thus, you could shorten it down and say that what I told the delegates at the Committee on Disarmament was, "the conditions are right, you are optimistic that you can get a treaty. Here, produce a treaty."

We have been holding to a policy in our country for nearly 15 years of nonproduction and nonuse. That is in stark contrast with what the Soviets are doing, but we can't hold that position forever. Produce a

treaty or we are going to have to produce gas. We don't want to, but that will be our position.

I think that is the position of many Members in the House of Representatives. I think that will be the dispositive point in the debate in the House of Representatives. The possibilities that will flow from the approach that I suggest if it were presented dramatically by the President of the United States are many.

I was interested this morning in the colloquy between Senator Jackson and the witnesses and yourself when he said we need to do more to get the message out about what the Soviets are doing. He said that we have an opportunity for exploitation that may be worth more than adding dollars to the defense budget.

I think he is right. I think that we have not done a good job of explaining what the Soviet Union is doing. I think we need to get that message out.

It is very hard for people around the world to listen to a message like that when they see us asking to commence production of binary weapons. It is confusing to them and the Soviets can play off of that by saying the Americans are producing, they are getting ready to produce a new age of chemical weapons.

So, it seems to me that we are frustrating our own opportunity to bring the contrast out to the people of the world. That is why I think that the possibilities are many.

If indeed the people of the world see the Soviet Union and the United States as particeps crimini when it comes to nuclear weapons, we can build some trust which will carry over in other areas distinguishing our policy and practice on chemical weapons with those of the Soviet Union.

OPPONENTS OF NUCLEAR FREEZE

Those who are opponents of the nuclear freeze, and I think that includes you, could make the case that we are willing to take a limited risk in chemical weapons by continuing the Nixon unilateral freeze for a limited period of time, but we can't take a similar risk on nuclear weapons because they are so different in their nature and most everyone agrees that we must do some modification even as we seek a freeze or a reduction of weapons.

Such an initiative as I have suggested would be a logical followup to the presentation made by the Vice President at Geneva. It would authorize action and otherwise contribute to the environment necessary to reach a treaty at the Committee on Disarmament.

A show of good faith, I believe, would carry over to the START negotiations as well as other ongoing disarmament discussions. It would reopen discussion in diplomatic circles of chemical weapons use by the Soviets, a topic which now regrettably has slipped to the back burner.

There was some comment about the work done by General Ezz, the Egyptian who tried to develop the facts and after an extensive bit of work by him it just slipped off into obscurity and we have not heard much about it.

Mr. Chairman, I believe we have a rare opportunity to alter the entire debate on freeze, reduction, and negotiating techniques by following the course I have set out.

The restatement of an existing unilateral freeze on chemical weapons creates a new juxtaposition which will set off a new round of analysis in diplomatic circles, but just as importantly among the opinion makers—particularly here in this country—who seem to have run out of ways to think about the wisdom of the President's approach on the nuclear front.

By this action, they as well as the average citizen, would be forced to analyze and admit that there are limits to what we can responsibly do as we search for ways to get rid of the horrifying nuclear and chemical weapons that threaten our very existence.

Best of all, if we can prevent the Soviets from linking the chemical weapons issue to other ongoing discussions, we can draw a clear contrast between our policy and practice on chemical weapons. That is worth a lot when it comes to convincing people whom they can and should trust and trust is what we need right now.

Thank you.

Senator WARNER. Thank you very much.

Have you a moment or two—you have given generously of your time since you have been here since 8:30 when the hearing started—to have Admiral Davies provide his testimony? I would like to enter into a slight dialog on some of these issues you have raised.

Mr. BETHUNE. Absolutely. I will be delighted to hear Admiral Davies. I am at the disposal of the committee.

Senator WARNER. Our next witness will be Adm. Thomas Davies. I have known the admiral for many, many years. We have worked together in the Department of the Navy and I have the highest respect for his professional capabilities. This committee is privileged to have him appear here today to present his views.

STATEMENT OF REAR ADM. TOM DAVIES, U.S. NAVY (RETIRED)

Admiral DAVIES. Thank you very much, Mr. Chairman.

Mr. Chairman and members of the committee, it is a pleasure to be able to share with you my conclusions on the subject of chemical warfare—which are based upon my experience as a naval officer and also as a participant, for many years, in negotiations on this subject—both international and within our Government. I hope that you will find these helpful in your examination of this important subject.

My 36 years of active duty in the Navy, included assignment in command at sea and ashore, in operational and technical areas. My last sea duty was as commander, Carrier Division 20, and my last duty ashore was as Chief of Naval Development.

I retired early to accept a Presidential appointment as Assistant Director of the U.S. Arms Control and Disarmament Agency. In that position—which I held for 7 years—my responsibilities included those for the chemical warfare negotiations with the U.S.S.R.

In the operational context, I believe that you will find that many military officers feel poison gas is a weapon of dubious merit. After its use in World War I, there have been only occasional reports of its use in special cases—usually against primitive or unprepared forces.

However, it has been mostly characterized by nonuse, although extensively defended against: World War II being the classic case of nonuse.

The field commander with facilities to use it must consider the tradeoff between using his weapons to deliver conventional explosives or poison gas. If he uses his guns or aircraft to deliver the chemicals, they cannot be delivering explosives.

When he adds to this the necessity to protect his own forces against his own chemicals—a necessity which will greatly restrict their movement and speed—he will usually conclude that more conventional weapons are his best choice.

Obviously, one must take account of the possibility that the enemy will choose to use it, and so the troops must be trained and equipped for chemical defenses.

Historically, some such analysis has been made by both sides—usually with the conclusion on both sides not to initiate its use, but to be prepared for its use against themselves.

Certainly in World War II there were no other restraints or inhibitions—and, of course, the Nazis had substantial stocks of the then-new nerve gas.

Currently, most national stockpiles are justified on the grounds of deterrence. That is, our commanders see no great utility or necessity for our own use, but feel that the enemy must not be allowed the unchallenged use of CW to his advantage.

This seems to make CW a good candidate for mutual arms control constraints. The utility of the weapon is dubious—for either side—and therefore both may well stand to gain by an effective agreement to destroy their stockpiles and facilities and thereby realistically prohibit its use.

The U.S.S.R. has proposed such talks in various international fora for a number of years, and toward the end of the Ford administration the United States decided to initiate talks with them. It is noteworthy that our western allies have been among the international advocates of conducting such negotiations.

From the outset it was evident that the critical area would be verification, and this proved to be the case. Some headway in this area was made in the earlier part of the talks, but the last year—1980—was one of very little progress.

REALISTIC VERIFICATION

It was not at all clear that the Soviets would be able to swallow a plan for realistic verification—a problem apparently stemming from their paranoia about visitors to military, technical, or industrial facilities in the U.S.S.R.

The fact is that verification presents a problem. Actions proposed under such a treaty would be twofold:

(a) A phased destruction of declared stockpiles—at a single location with international observers.

(b) Destruction of manufacturing facilities under international observation—to insure that stockpiles cannot be refurbished.

The first action requires presence of international inspectors at a special destruction facility within the Soviet Union, something which the Soviets were not able to agree to.

The second suffers from the same problem but additionally is complicated by the fact that there are few unique manufacturing facilities in either nation.

A portion of the manufacture of nerve gas is accomplished in commercial or—in the U.S.S.R. multipurpose facilities, the destruction of which would be uneconomical and also without real significance. This leaves the plants for filling munitions as the primary target for destruction. This problem is real, but I believe will yield to serious negotiations.

To summarize, I believe that we could put funds to more productive use than replacing our present stockpile with a new agent. This opinion is based upon the following:

First, chemical warfare is and has been of marginal utility in modern warfare. Its use seems limited to use against primitive peoples.

Second, we already possess a very substantial stockpile with an outstanding safety record.

Third, attempting to substitute a new agent in our only deployed stocks may well cause the host country to ask for withdrawal of those currently in place.

Fourth, the international climate now is such as to be helpful in negotiating an effective and verifiable arms control treaty with the U.S.S.R.

This concludes my statement.

Senator WARNER. Thank you.

Just an observation by the Chair. I certainly share your hope that we can resolve this issue through an effective and verifiable arms control agreement which presumably would lead to the elimination from inventories of the super powers of these weapons.

FAILURE OF UNILATERAL FREEZE

Our colleague in Congress, however, has pointed out that it has been 15 or 16 years that we, the United States, have vigorously followed a policy of a unilateral freeze and it hasn't worked. In that period there have been reported instances where chemical-type weapons have been employed against people, although there is some circumstance character to those cases.

It is a mix of circumstances and direct evidence. While I support you and join you in the ultimate goal of resolving this dreadful issue by means of an arms control agreement, we have not had success to date.

Congressman Bethune, my question would be what is the reasonable period of time within which we the United States should continue to adhere to this policy, recognizing that we have in Europe today several hundred thousand uniformed personnel together with their families, of course the welfare of the host country citizens, all of whom in my judgment are being put today at substantial risk because of the imbalance in the capabilities of the two military forces?

What is that reasonable period?

SIGNS OF PROGRESS AT GENEVA

Mr. BETHUNE. It is always hazardous to state a specific time frame, but I do think there are some signs of progress at the Committee on

Disarmament. The Vice President's initiative is a good one. There are some circumstances not present in the past that seem to be present right now that create an opportunity.

I, in my conferences with our delegation in Geneva, tried to find out what sort of evidence we could see in the near future that would indicate some movement by the Soviets. I was given to understand there are certain benchmarks of progress that could be seen and could be recognized as progress that could be forthcoming within the next 6 months or 1 year.

For instance, the Soviets could declare their production facilities and take steps to make sure that we would know that that was an accurate declaration.

There could be some progress in the discussions about verification of destruction of existing stockpiles.

There could be progress in the resolution of the question of use.

These are things that could be done right away.

Now, to reach a multilateral agreement would take a good deal of time, maybe 3 or 4 years. But these are signs we could see soon. If we don't see this kind of evidence after continuous adherence to our policy, then that would be information that would cause this Congress, I think, to take another look—people like myself.

Senator WARNER. We would have to put at risk our people for a period of 2 or 3 more years in which to ascertain the possibility of reaching an agreement and then if the agreement fails, that risk period would continue until such time as the United States is able to build up its capability.

So we are looking at a compounding of time in my judgment, time in which to work on an agreement and time thereafter in which to provide capability to our military.

BINARY WEAPON ISSUE

Mr. BETHUNE. The proposals that are being suggested by the Department of Defense now are not to come on line for some time. In my judgment the House is not going to approve the binary weapon issue irrespective of what the Senate does, irrespective of what the President might suggest.

They are not going to do it. The votes there are heavier than they were in the last Congress. In any case, if this Congress did agree to authorize the production of everything that the DOD is asking, it would not come on line for some time.

By the way, in the debate last year in the House of Representatives I brought up the point that there had been no dynamic testing of the Bigeye, no dynamic testing of the binary and there were a number of problems with the systems and that it was not unlikely that there would be slippage in the time schedule.

I think that that is going to be the case, certainly with the Bigeye. There might be some more specific information on that even later today.

In this case, Senator, my point is that if you will look at Dr. Gold's statement pretty closely, there is an important word on page 21 in the third line. The word is "future" reliability of our current artillery projectiles.

I don't think the DOD has taken the position that our current artillery projectiles are presently unreliable. I think they are presently reliable and do constitute, as Secretary Brown said when he was at Defense, a credibile deterrent, enough to force the enemy to suit up at this particular time.

The question on the Bigeye is another question altogether. That is the deep strike capability that has been discussed. If the Bigeye is not produced or not authorized for production, then basically you are left with the contention that we ought to substitute the binaries for what is right now a reliable 155-millimeter artillery shell.

The point I am making is this: I don't think there is that much risk in terms of time or deferral associated with the suggestion that I make when you measure it against the great advantage that we would have in negotiations for the next year to absolutely beat the Soviet Union about the head and shoulders, drawing this contrast between our policy and our practice and their policy and their practice.

I think we give away an awful lot when we abandon our 1969 policy.

MODERNIZATION AN INDUCEMENT FOR ARMS CONTROL

Senator WARNER. That thesis is in sharp contrast with the thesis we are proceeding with under START. There the President has outlined a parallel course of diligent, conscientious negotiation, at the same time a modernization of our strategic forces, the theory being that modernization would be an inducement for the Soviets to accept a fair and equitable verifiable type of arms control agreement.

Am I correct that there is a sharp contrast between the two programs?

Mr. BETHUNE. There is, but I think it is a contrast that would serve the administration well because it highlights the reason why the administration is proceeding as it is in the case of nuclear weapons.

I know in my own case I am called upon many times by the freeze movement people to explain the contradiction: "How can you suggest that we ought to take the approach that you advocate in chemical weapons, but then you vote with the administration and with Senator Warner and others on the freeze proposition?" they ask.

I simply point out to them that the distinction is like the distinction between lightning and a lightning bug. There are logical reasons and historical reasons why I think we should proceed differently in the case of chemical weapons.

The admiral has stated many of the logical reasons why chemical weapons are different. I think the history of chemical weapons, the policy statements made by our country, the fact that today the Soviets are not out there using nuclear weapons right now, but they are using, according to the best evidence we have, chemical weapons, we, I believe, have an opportunity at this moment to focus on that and draw the sharp contrast which I think would be worth more than, as Senator Jackson said this morning, adding all the dollars to the defense budget.

We need that kind of trust right now, Senator. I think the problem that the President has, the problem that those of us who are supporting him have, is that people are losing trust in us because we are saying we want to reduce arms, but we are asking for a buildup.

That is a contradiction that is very difficult to explain. We need all the trust we can get.

I think this is an area where we can establish a modicum of trust for the administration by showing that at least in this one area we are willing to take a little risk in the interest of doing the right thing.

If the President with his communicative skills would pick up on this, I think it would give him the kind of ammunition that he needs to show that he can be trusted and that this administration should be trusted. That is my point.

Senator WARNER. It is commendable that you have the courage to try to find a distinction. While you and I may disagree, I certainly respect you for your position.

ONSITE INSPECTION

I would like to ask you, before I turn to the admiral, in your judgment is it necessary as part of a future arms control limitation agreement on chemical weapons to include a means of verification which in fact would embrace onsite type of inspection and not rely on heretofore national technical means?

Mr. BETHUNE. Absolutely. I think that is achievable. I think one of the problems that the Soviets have and have had with onsite inspection is the point so graphically made by the admiral in his testimony, that the history of the Russian people has been to resist people from outside; they have a distrust of people from outside their country.

Senator WARNER. Limiting travel in the Soviet Union. Like you, I was a delegate to the United Nations Disarmament Conference. I was this past summer. I had an opportunity to talk to the Soviet Ambassador confidentially about this subject.

While I detect some sincerity on their part, I was not able to obtain from them any assurances that this onsite inspection would be an integral part of a future agreement. You say that it would be an integral part.

Admiral, what is your position on onsite inspection being an integral part of any future arms control agreement?

Admiral DAVIES. I think it is anticipated, and it was always anticipated in with the chemical warfare ban negotiation, that onsite inspection in some form would be part of it. Destruction of the stockpiles has to be done by onsite inspection.

One of our earlier alternatives was to suggest to the Russians that they do the destruction of the stockpile in an Eastern bloc nation rather than the Soviet Union—perhaps in East Germany. This seemed to have some possibility.

In another negotiation, they handled onsite inspection in a more flexible way than they have in the past. Mr. Gromyko's speech of some months ago in the United Nations also suggested that they were getting more flexible about onsite inspection.

I would like to add one comment. Onsite inspection is not a panacea. There are two basic things about it. You can be led down the primrose path thinking you have onsite inspection and you go to where you think you would see something and you could be looking in the wrong place entirely.

The instrumentation and the scientific methods of the national technical means are really essential so that if you have onsite inspection, you at least go to the right place. It is not an easy thing.

In another negotiation, we did a lot of work, develop a lot of our procedures and so on for onsite inspection. We found it to be very difficult to make them watertight. It is a thing that I think we have to have.

I believe the Russians are more flexible on it now and there is a good chance we will get it, but it will take tough negotiation. It is not the only thing. National technical means will be a crucial part of it.

LIMITED PROTECTIVE CAPABILITY ON SHIPS

Senator WARNER. In your extensive experience as a sailor and commander of a carrier division, as you know, today, the United States has very limited protective capability aboard a ship, both for the individual and operating mechanisms aboard ships as such.

Our strategy basically is, in the event of a confrontation with chemical warfare weapons we have no alternative but to withdraw the present ships that we have now and perhaps future ones will be designed in such a manner that they will be able to engage in combat under that environment. But at the present time, we have to withdraw them.

Am I correct on that?

Admiral DAVIES. All of our ships have a ship ventilation system that can be closed and would, to a large degree for a period of time, obviate any difficulty from being in a chemical environment. The environment at sea is such as to cause dispersion of any chemical attack. It occurs very quickly. You run out of the area.

The general view of most of the Navy people that I have talked to over the last several decades has been that chemical warfare at sea is not a very important threat. Now that may be a misjudgment on our part, but that is the way I look at them and I think that is the way most naval officers look at them.

In actual experience, since there is a ventilation system in the ship, we have the ability to close it down and make it a complete capsule so that the ship does not suffer.

Senator WARNER. Even the engine room with the intense heat?

Admiral DAVIES. The engine rooms in the older ships do have a problem because of the heat, but the engines themselves, of course, are cased so that the intake of air goes directly into the engine—by that I mean the boilers, or gas turbines nowadays—so it would not get in. It is not a thoroughly designed absolutely gasproof envelope, but it works.

Senator WARNER. It would degrade the operational ability of a carrier task force substantially, particularly if done with a persistent weapon?

Admiral DAVIES. If you had a persistent weapon that existed on the flight deck, for example, it would do that. I don't know of any weapons in that category at the moment. Because of the amount of wind on the flight deck, it would be pretty unusual to have anything persistent in that sort of service.

Senator WARNER. As you know, present Navy policy is very restrictive especially on chemical weapons handling aboard carriers.

Does that not speak for the modernization of weapons so that we can put one together so that could be handled safely by our sailors?

SAFETY ABOARD SHIP

Admiral DAVIES. It is true that the safety aboard ship is a crucial item. We have had with chemical weapons an excellent safety record, surprisingly good, as a matter of fact. I think you will find that the Navy point of view would be that if you can make it safer, it is better.

Senator WARNER. I have no further dialog to exchange with our witnesses.

Do you have any further testimony?

Admiral DAVIES. I would like to add one point on your question to the Congressman about the time period.

The discussion and the Vice President's proposal were in the conference at the Committee on Disarmament. The way that machinery works over there—and I am a little out of date, but I spent 7 years dealing with them—for any important treaty, there has to be a bilateral agreement between the Soviet Union and the United States before anything can really get through the multinational committee.

RENEW BILATERAL NEGOTIATIONS

I think one of the most important things to do, if we were to follow the proposal outlined by Congressman Bethune, would be to start bilateral negotiations again, which we dropped in 1980 and have not resumed since with the Soviet Union.

Mr. Gromyko's speech in the United Nations offers an opportunity to do that. I think that would be the first move. Now, once you get a bilateral agreement, which might take 2 years, but throughout which you could see whether the negotiations were really grappling with the key issues or whether they were simply diffusing the whole thing by dealing with unimportant issues, during that period you could make some judgments as to where we were going, I think it would take about 2 years to get a bilateral, even with the best of intentions on both sides.

Thereafter, getting a multilateral treaty through the Committee on Disarmament would take on the order of 6 months to 1 year.

Senator WARNER. In point of fact, if my recollection serves me, we conducted bilateral negotiations on this subject during your tenure for a period of 3 years.

Admiral DAVIES. Yes, sir, we did for a number of years.

Senator WARNER. Why no success, Admiral?

Admiral DAVIES. The basic problem was the verification that I mentioned to you. The nature of it is that it would be equally difficult for the Russians to verify our compliance, mind you, because of the fact that even if we were to go in and take a particular piece of machinery out of the plant that was used to make the precursors for nerve gas or whatever, it still could be done by other pieces of machinery in that time plant.

Finally, there is the stockpile matter. Destruction is straightforward mechanically, but getting at the verification of the destruction is a tough problem.

Senator WARNER. Is it solvable?

Admiral DAVIES. I think it is solvable. We were getting very close to it as a matter of fact, in my opinion, when the negotiations were dropped.

Senator WARNER. What has changed, in your judgment, in the period since the bilateral negotiations were terminated in the environment to make it more conducive today than it was in the 3 years during your tenure?

Admiral DAVIES. From the standpoint of the Soviet Union, I think Gromyko's speech offered some hope. He mentioned onsite inspection. I do think they have come to feel that that is something that they could live with.

I can remember in another negotiation, if I can make a sort of sea story out of it, we made an offer early on that the Russians turned down and about 2 years later several of them told me they wished they had taken us on it at the time because then our position changed in between and the matter became sort of hopeless.

I believe they have considered this whole thing themselves and from what I have heard about what goes on in Geneva, from Mr. Gromyko's speech and other things, it is a visceral feeling, but my feeling is that they now would be a little bit more reasonable on these things, although, as I say, there are tough technical problems.

I think onsite inspection plays a part in it, but I do think particularly in manufacturing facilities we are going to have to use national technical means and we do have national technical means.

There is one particular system that I am thinking of that has never been used in this area and I think should be and could be used.

Senator WARNER. Thank you very much.

Mr. BETHUNE. I think there is growing awareness among our allies and nonalliance countries and the Committee on Disarmament about chemical weapons, there is a realization now that the smaller countries are the countries most likely to be the victims of the use of chemical weapons.

I think the activities of the Soviet Union throughout South Asia have generated an intense interest by people on all sides.

I think also the election of President Reagan and the discussion that has ensued here in the Congress about chemical weapons has been healthy. I wish it had been more visible than it has been. I think this has triggered a lot of interest.

I think the conditionality of the approach that I suggest and the fact that right now we are adhering to policy, but there is some question about what the United States is going to do on the chemical weapons front. These are all factors that were not present at the time that the Admiral was trying to get a treaty.

I think if this is all managed carefully and if we are not divided among ourselves and if out of all of this we can fashion a comprehensive political strategy which would be advanced by myself, by you, by opponents, by proponents, by the administration, all in league, and build the kind of environment in the next year, we could see some progress and then we would know better where we stand.

Senator WARNER. One final observation. As I say, Admiral, I admire your position.

Nevertheless, as a responsible advocate in this field and a pragmatic Member of the Congress—and you just witnessed this morning from

8:30 to approximately 10:45, when we opened the session, a series of briefings by members of the Department of Defense to the effect that today our Armed Forces are in a situation that I would characterize as high risk—I wonder how long we can take that gamble in good conscience to submit our young men and women in this environment and recognizing that risk.

Mr. BETHUNE. I think within the next year we will know because the Committee on Disarmament is going to have a session this summer which I think will be a very important time to determine whether or not we are making any progress.

I would make two points. In spite of all that we saw and heard this morning, DOD is only asking for authority to produce a new binary shell, the 155-millimeter artillery shell.

Senator WARNER. And Bigeye.

Mr. BETHUNE. And Bigeye. As I believe the facts will show, the existing 155-millimeter artillery shells are reliable and the Bigeye has problems.

My point is that if we were as drastically behind or our problem was immense—we are already getting money allocated for defensive measures—it seems to me they would be asking for a good deal more than a replacement for a shell that is already reliable.

Senator WARNER. In fairness to them, they have not been given much encouragement over the period of time since Nixon put the embargo on it.

We will recess for less than 5 minutes. Then we will return with the other witnesses.

[Whereupon, at 11:53 a.m., the subcommittee took a 5-minute recess.]

OPEN SESSION RESUMED

Senator WARNER. We have an important task, however, I am reaching the opinion we will not have time to conclude this session.

In this open session, recognizing we have gone well beyond the original timeframe of this hearing, but having the need to put certain things in the record of an unclassified nature, would each of you touch on those points verbally at this time that you feel are important and then submit for the record the balance of your statement this morning? Can we proceed in that fashion?

Dr. GOLD. Yes.

Senator WARNER. Then we will adjourn the hearing and we will have a little informal caucus on how to structure a second hearing.

Dr. GOLD. How much time do we have?

Senator WARNER. The Chair will do his best to stay here 30 minutes. I have to preside over the Senate very shortly.

STATEMENT OF DR. THEODORE S. GOLD, DEPUTY ASSISTANT TO THE SECRETARY OF DEFENSE (CHEMICAL MATTERS)

Dr. GOLD. I will submit my statement for the record. I do want to make one point. I am sorry Congressman Bethune has left. I would have suggested that he need not have suffered through 21 pages of my turgid prose to find the one word on page 21 which hints at the fact that some of our current artillery shells are useful today.

There is a chart on page 7 which highlights the fact that the most useful part of our stockpile is the current 155 millimeter and 8-inch artillery shells and a paragraph on page 9 which says, "The short-range systems of significant military utility today are the 155-millimeter and 8-inch nerve agent artillery projectiles which constitute 6 percent of the total stockpile." There are limitations with these as well, many are filled with the less useful—for short-range systems—persistent agent and the 155-millimeter projectiles cannot be fired to the maximum range of the new howitzers.

Senator WARNER. I think that is clear in this statement. I did not want to enter into cross-examination. We have certain rules of amenities here in the Senate. We don't try to cross-examine our colleagues. The record speaks for itself.

ELIMINATING THREAT OF CHEMICAL WARFARE

Dr. GOLD. Without a doubt all of us now at this table and the previous witnesses share a common goal in this area. We want to eliminate the threat of chemical warfare by achieving a complete and verifiable ban on chemical weapons.

There is a substantive point of disagreement, particularly with Admiral Davies. Contrary to his view, our current stockpile is not adequate for its deterrent mission. To be adequate we need the capability to force Soviet military units into a protective posture or at least give them the option of taking actual casualities from being exposed to the chemical agent or virtual attrition from trying to operate in very cumbersome chemical gear and equipment.

Our current stockpile cannot provide that capability. It is not a question of numbers. We are not arguing for a bigger stockpile. We are asking for a significantly smaller stockpile than we have today, not because we are unconcerned with the threat, but because we think a small stockpile, if properly configured, can give us the adequate deterrent we need.

We are not attempting to match the Soviets in their force structure, in their amount of agents and in their number of delivery systems. We are requesting, what in the nuclear arena might be called a minimum deterrent posture. We need the capability to force the Soviet military units not only also their tactical troops within a few kilometers of the front line, but their air bases, their rear echelon troop concentrations and facilities, their command and control center, their tactical air defense, and other combat support and supply functions that are essential to offensive operations, to perform in protective equipment in contaminated environments and thus suffers degradation of performance similar to what they can impose on our troops.

Otherwise they would have a significant advantage on the battlefield and therefore a strong incentive to use chemicals. That is the essential difference between the point of view that was expressed by the previous witnesses and our position.

If we did have an adequate deterrent, then perhaps we could afford to wait to modernize or improve. However that is not the case, we do not have an adequate deterrent today.

We have not produced chemical munitions since 1969 and the current weakness in our deterrent capability is due to the obsolescence of the

munitions and delivery systems that were produced in the fifties and early sixties.

The fundamental and most serious deficiency is the lack of capability to effectively target Soviet troops beyond artillery range. No amount of maintenance can correct that shortfall. Without such a capability we expose our troops; we put them at risk to have to operate in a contaminated environment without being able to impose such an environment on the Soviets.

This question of the adequacy of the current stockpile is the fundamental point of disagreement, at least as I understand the previous witnesses.

I will finish with a few words on arms control.

We all fervently share the same goal. I share the hope of the previous witnesses that the chemical arena does offer a unique opportunity. Military people don't like these weapons. If there is relative balance, there is no advantage to either side from using it.

Senator WARNER. World War II is living proof of that theory.

Dr. GOLD. Absolutely. So perhaps there is hope that of all weapons, chemicals are the one where the world has an opportunity, with an effective and verifiable ban, to truly rid for once and for all an entire class of weapons. But let us not kid ourselves, it is up to the Soviet Union.

For almost 4 years, from 1977 to 1980, the United States negotiated with the Soviet Union bilaterally. There was not substantial progress on the key issue of verification and compliance. Last June, after the Senate authorized binary weapon production, the Soviets tabled a proposal which gave a hint that, yes, they might be willing to talk about onsite inspection. Since the full Congress decided not to answer any questions on the binary weapons, they have been unwilling to elaborate on that limit, to provide any notion of what they mean.

So, the United States took the initiative. As Congressman Bethune said, in February the Vice President went to the Committee on Disarmament and gave a marvelous speech, exhorting the members to move forward rapidly to achieve a complete effective ban. A few days later Ambassador Fields presented a 26-page document detailing the U.S. view of what we think should be the framework of an effective treaty.

I believe there are two essential conditions for achieving a treaty. First, the Soviets must perceive no advantage from retaining or using chemical weapons.

Second, there must be pressure from the international community to get them to move toward acceptance of onsite inspection.

I saw examples of such pressure at the Committee on Disarmament. That is why I believe the multilateral forum is the appropriate one for now.

Certainly to get a treaty at some time we will have to get into serious bilateral discussions with the Soviet Union, but now at the Committee on Disarmament at Geneva not only our allies but many of the nonalined nations are taking strong positions on the need for verification, saying we cannot have any more treaties without effective verification measures and that effective verification, for a cleared weapon base, means onsite inspection.

These two conditions are necessary. However, whether they are sufficient to motivate the Soviet Union to overcome centuries of Russian suspicion of the outside world, I don't know and I doubt if anybody in this room knows.

The position of the United States should be and is that we will give the Soviets every opportunity to achieve a chemical arms base. We should take the initiative, be willing to talk, and have reasonable proposals in front of them at all times. We are doing this now and will continue to do so.

Our delegation to the Committee on Disarmament, as you know, is headed by a superb individual, Lou Fields, who has the respect of everyone at Geneva.

Senator WARNER. I might state for the record that I have today received a lengthy communication in writing from him representing the Department of State, first expressing his regret at not being able to be present today and outlining again where he feels the United States is at this time in terms of negotiating.

[The communication referred to follows:]

U.S. DELEGATION,
TO THE COMMITTEE ON DISARMAMENT,
Geneva, Switzerland, April 6, 1983.

Hon. JOHN W. WARNER,
Chairman, Subcommittee on Strategic and Theatre Nuclear Forces, Armed Services Committee, U.S. Senate, Washington, D.C.

DEAR MR. CHAIRMAN: I regret very much that my responsibilities in the Committee on Disarmament preclude my appearance at this time before your subcommittee to testify concerning the President's budget proposal for the chemical weapons modernization program. As you know, I have a strong interest in and commitment to the negotiation of an effective and verifiable ban on chemical weapons. We are currently attempting in the Committee on Disarmament to achieve that objective as a matter of the highest priority.

Vice President Bush announced a new U.S. initiative in the chemical weapons area in his speech to the Committee on February 4th and I tabled the "United States Detailed Views on the Contents of a Chemical Weapons Ban" in a statement to the Committee on February 10th. Unfortunately, during the first eight weeks of our thirteen week Spring Session serious discussions were obstructed by procedural maneuvering; the Eastern bloc, aided and abetted by certain members of the neutral and non-aligned states (Group of 21) raised numerous procedural questions related to the Committee's agenda and establishment of our working groups. The result of this deplorable development has been a blockage of all substantive work in the Committee and a temporary frustration of our efforts to achieve progress on a chemical weapons ban. It was only last Thursday that we re-established the chemical weapons working group and elected Ambassador Donald McPhail (Canada) as its chairman.

We have, however, done some useful work in the CW field. We held a series of meetings to discuss our initiative and to take questions concerning our detailed views from interested delegations. Even though we were unable to explain our detailed views more formally, we sought every available means of pursuing our objective and it was useful to do so.

During this period we had the good fortune to have two distinguished visitors who are associated with the chemical weapons issue in Washington—Dr. Theodore Gold, Deputy Assistant to the Secretary of Defense for Chemical Matters, and the Honorable Edwin Bethune, Member of Congress (R., Arkansas). Each of these gentlemen held a series of conversations with representatives and experts of many delegations here. As you know, they represent different views on the modernization issue. Both, however, stressed their serious and active support for achievement of an effective and verifiable ban on chemical weapons, and their support for our initiative in the Committee. As well, both expressed their commitment to a strong U.S. deterrent posture pending achievement of that goal.

It was extremely useful for our negotiating partners to gain an understanding of the deep degree of commitment of the United States Government to these negotiations, and to the maintenance of a strong deterrent, even though there may be disagreement on the means to achieve our goals.

I believe there is a growing realization among the Committee that the U.S. came here with a serious purpose, and a keen interest to move toward a successful chemical weapons negotiation. I cannot recall more concerted interest in the Committee on behalf of a proposal than has been prompted by our initiative. And, although I cannot conceal our deep disappointment over the procedural delays which have thus far thwarted our efforts, hopefully we are about to begin serious work.

We now have re-established the chemical weapons working group under an able chairman, and will continue to press for movement. However, there are only a few weeks left in our Spring Session and the chance for real movement is negligible. The best we can hope for is that the Committee will be organized and prepared for serious work during the summer session. It is unclear whether progress can be achieved even during that period, especially with the frustrating experience of three years of bilateral negotiations with the Soviets on this subject. We will apply ourselves diligently to the task and hope for some progress. Of course, the key is in the hands of our Soviet colleague. We have made it clear to him, and the entire Committee, that Soviet acceptance of effective verification and compliance provisions is a prerequisite for real progress. The need for strong verification measures is, I am happy to report, becoming broadly accepted among the Group of 21. We are continuing to advocate our position on the verification issue very strongly, and I am encouraged that so many delegations are recognizing the strength of our argument. I can only speculate as to whether the Soviets will begin to seriously consider the issue.

This leads me quite naturally to comment on the issue of the U.S. chemical weapons modernization program as seen in the context of this negotiation. It is simply too early for me to report any realistic prospect in the near future for achieving an effective ban—one which the Senate would feel comfortable in giving its advice and consent to ratification. The Soviets have not yet responded in any substantive way to our detailed views. While I wish that I were in a position to give the Senate an optimistic view, my judgment is that we are some years away from producing the kind of agreement which President Reagan has authorized me to negotiate—one which keeps faith with his commitment to assure that arms control and disarmament agreements will be both effective and verifiable.

The litmus test of Soviet political will in negotiations on a chemical weapons ban must be agreement on an international regime for systematic on-site inspection of key activities. The Soviets have suggested that they are willing to consider some regime for one type of on-site inspection; however, we have been unable to clarify what sort of regime it has in mind. My judgment is that we are a considerable way from resolving the critical verification issues. Even if there should be a breakthrough, the negotiation of detailed arrangements would be a protracted, time-consuming effort.

Thus, you and your colleagues are faced with a most difficult decision. I cannot assure you of an early prospect for the achievement of an effective and verifiable chemical weapons ban, given Soviet traditional hostility to meaningful on-site inspection, although this remains our hope. You must decide whether we should take out the necessary "insurance" that chemical weapons will not be used while we continue to pursue our goal of an effective ban. The decision becomes difficult when we face, as we do, the economic realities of the day and when savings in budget expenditures is the watchword. There is, of course, another reality of our time, i.e., that chemical weapons are being used, despite the existence of a ban on such use. In such circumstances, it would seem prudent to me to assure that the temptation to use such weapons will be minimized by the knowledge that we possess the capacity for a prompt and effective response in kind.

I might add, in conclusion, that, as a negotiator, the public debate on the binary issue has the effect of reducing such leverage as we may have. There is no doubt that the Soviet Union has the overwhelming advantage in this field of weaponry. They have modernized their chemical warfare capability; whereas, we have not produced such weapons since 1969. In these circumstances, there seems to be little incentive for the Soviets to negotiate away a clear, preponderant advantage, particularly if they are confused as to our commitment to maintain a viable

deterrent capability. There is, to be sure, evidence of Soviet apprehension over the binary weapon. Their statements in the Committee and particularly the Bethune-Issraelyan conversation all suggest their concern over our possible acquisition of a modernized deterrent capability. I hope that whatever action the Congress takes this year, it will be supportive of our negotiating efforts.

One other factor is significant. The fact that the negotiation is taking place in the Committee—a multilateral forum—keeps the Soviets under a certain pressure. They are bothered by the growing support of the Group of 21 for our position—especially on the verification issue—and are loath to take public positions contrary to popularly held third world views. This is, however, a thin advantage for us and highly volatile. At some point, if the Soviets decide to negotiate seriously, they will pay little attention to world opinion, and at that point they will be influenced only by their own perceptions of their national interests. If they perceived that their present advantage might be neutralized by our acquisition of a modernized and effective deterrent capability, it could provide a powerful incentive.

We will keep you currently and fully informed of our progress here in Geneva and I look forward to an early opportunity to appear before your Committee to give a more detailed report of our negotiations.

With warmest regards,

Respectfully,

LOUIS G. FIELDS, Jr.,
Ambassador, U.S. Representative
to the Committee on Disarmament.

Dr. GOLD. Finally, I believe there is agreement that even if the Soviets became serious today, saying yes, we are really ready to sit down, and talk, it will not be easy. There are tough verification issues. It is not equally difficult for both sides as suggested by Admiral Davies: there is no doubt it is far more difficult for us to verify what they are doing than the other way around.

We are talking about several years of tough negotiations to achieve a treaty. If we stop everything now, if we continue to defer, if we continue to allow our forces to remain in a vulnerable position, what is to prevent the Soviets from doing what they do so well: Offer some hint, some unsubstantiated hope or hypothetical promise of getting serious about verification? What is to prevent that from dragging on this year and next year and the year after?

Congressman Bethune is right, if we got everything we asked for from this Congress, we would not have our binary stockpile built up to what is required for deterrence, which again is significantly less than the total amount we have today, until the early 1990's. So, we cannot redress this situation overnight. I see no other alternative than to move forward and restoring a credible retaliatory capability, otherwise we will not have any chance of achieving what we all want: progress toward eliminating from this world a class of weapons by getting a verifiable treaty.

I will stop my comments at this time and turn it over to my colleagues.

Senator WARNER. We will go in the same order as we had previously.

STATEMENT OF BRIG. GEN. WILLIAM E. KLEIN, U.S. ARMY, ASSISTANT DEPUTY DIRECTOR (FORCE DEVELOPMENT AND STRATEGIC PLANS), ORGANIZATION OF THE JOINT CHIEFS OF STAFF

General KLEIN. Mr. Chairman, I would like to simply put my unclassified comments into the record. I would make one point.

Congressman Bethune said even if we went ahead with the program this year, we would not start production of Bigeye, and that is correct. He said that we would only produce the 155 round which would give us no more capability. That is true that we would only produce the 155 round, but it would give us considerably more capability because that new round has a range of 22 kilometers which, when you look at it, puts the second echelon at risk.

Nonetheless, that doubles the current range of the 155 weapon that we are using. So it does give considerably more capability and does not put some of the Soviet second echelon at deeper ranges at risk.

I will also for the record enter the net assessment slide which I showed on the vugraph. I would only reiterate how far ahead of us the Soviets are.

As I mentioned in my comments, I would not begin to suggest a program to the Congress that would attempt in any way to catch up. What we have done is suggest a modest program which we would hope presents a very credible deterrence to the Soviets and in addition allow negotiators at the table to have something concrete with which to negotiate.

That concludes my comments, Mr. Chairman.

[The prepared statement of General Klein follows:]

PREPARED STATEMENT OF BRIG. GEN. WILLIAM E. KLEIN, U.S. ARMY, ASSISTANT DEPUTY DIRECTOR, FORCE DEVELOPMENT AND STRATEGIC PLANS, ORGANIZATION OF THE JOINT CHIEFS OF STAFF

It is a pleasure for me to appear before this committee representing the Organization of the Joint Chiefs of Staff and the unified and specified commands. General Vessey, the chairman, has stated that in the absence of an effective international agreement to remove existing and future threats of chemical warfare, the United States must acquire and maintain an effective chemical warfare deterrent retaliatory capability. A Soviet chemical attack would seriously degrade all aspects of United States and allied combat operations.

A purely chemical defensive posture is inadequate. It is possible to achieve high protection levels against chemical agents and reduce direct casualty effects; however, protective equipment and procedures severely degrade mission effectiveness. This degradation varies with temperature, type of activity and length of time forces must remain in a protective posture. The initial user of chemical warfare gains a tremendous advantage if he is the only side to use chemical warfare or doesn't have to be concerned with retaliation. If both sides have a chemical warfare capability, a potential user is less likely to perceive advantage from chemical use because he might also suffer chemical casualties and be forced to adopt protective measures. Casualty effects of chemical agents are not insignificant since there will aways be some casualties due to equipment failure or exposure before protection can be donned.

The initiator of chemical warfare has the major advantage of choosing the time and place for the use of chemical warfare. He can thereby maximize the impact on his own forces. By relying on protective measures alone, the United States and its allies concede that advantage to the Soviets. By achieving a credible chemical warfare retaliatory capability, we force the Soviets to consider the problems they create for themselves by initiating the use of chemical warfare since we would have the option of causing casualties and forcing them into protective posture at a time and place of our choosing.

Each service person is provided an individual respiratory protection system (protective mask, antidotes, a decontamination kit, a first aid kit, and a protective uniform for defense against respiratory and skin chemical and biological agent hazards). However, while this ensemble provides good protection, it degrades one's ability to perform the mission.

The thermal insulation properties of protective equipment can cause excess heat to built up in the body. The rate of build-up primarily depends on tempera-

ture, humidity, wind speed, work rate and the specific clothing worn. If the buildup continues unchecked, the body eventually collapses—a casualty of heat stroke/exhaustion.

Tests have shown that personnel in protective equipment can accomplish most of their normal tasks; however, their rate of accomplishment is generally slower and error rates increase significantly. This could cause serious impacts on personnel working with nuclear weapons.

The added bulk and weight of the protective equipment makes all movement more difficult, which accelerates fatigue and its proficiency/productivity degrading effects. Some tasks, such as inspecting engine inlets and working in small equipment bays, may not even be possible for large people because of the added bulk.

Peripheral vision is very limited when wearing the current mask. Activities requiring wide visual perception, like aircraft and equipment inspections, can be significantly more difficult and time consuming. In one Air Force exercise, both a nicked compressor blade and a loose rivet were missed during an engine check due to vision restrictions. Other visual activities such as sighting various weapons becomes difficult to near impossible.

The loss of dexterity while wearing protective gloves can cause problems for personnel using small hand tools, handling small objects, or requiring high levels of digital dexterity. In servicing avionics and communication systems, technicians must take extra time and care in placing and manipulating tools to avoid damaging sensitive, nearby parts. Typewriter and computer terminal operations can be slowed and error rates increased. The sense of touch is also greatly reduced especially when the hands become macerated.

Verbal communications, especially those using electronic apparatus, are degraded and the potential for error based on misunderstanding is increased. The necessity of wearing the standard flightline microphone and earphone sets outside the head gear distorts communications between cockpit and personnel on the ground, especially in the noisy flightline environment.

Individual performance standards can be determined by physical measurement much more readily than one can measure what the cumulative effect is on unit performance in combat. The performance is not only a matter of the psychological effects at moderate and high temperature, but is also a function of the impairment in sight, dexterity and hearing when actions must be performed in protective gear. We have not adequately experimented with the cumulative effect on units in field testing under actual or simulated conditions; however, degradation of the order of 50 percent or more will occur.

The present U.S. standard protective ensembles are more than adequate for protecting troops from threat-persistent agents while the troops are traversing chemically contaminated terrain, operating within contaminated terrain, and operating contaminated equipment; however, the loss in individual or unit effectiveness in combat situations due to wearing protective clothing ensembles will be much greater than that caused by chemical agents. Degradation in unit combat effectiveness could range from 80 to 100 percent, depending on weather, protective clothing ensembles, and levels of physical activity imposed on troops.

Morale and psychological stress, which are functions of being under attack, are contributing factors to the general physical discomfort caused by the protective clothing.

Comments from the unified and specified commands support the comments I have made today and they highly recommend that the United States continue to modernize its chemical stockpile by developing the binary weapons.

I'd like to wrap up my remarks by showing you some slides you've seen before from LTG Gorman's briefing on NATO-Warsaw Pact conventional forces. I feel it would be useful to quickly review the net assessment and put things into perspective from a narrower view of the chemical area. This first slide shows an update of the chemical warfare comparison. We've now confirmed since you saw this slide a few weeks ago, for example, that there has been a two-fold increase in decontamination equipment.

The next slide shows the offensive or retaliatory capabilities. In almost every area, we are behind the Soviets, even in those where we show both have the capability, our long range capability is limited to nonpersistent nerve gas only.

These last two slides present a comparison of protective capabilities.

As I indicated earlier, we have now confirmed an increase in decontamination vehicles (8,000–12,000 up to 25,000–30,000).

This last slide shows the emphasis the Soviets place on chemical training. In closing, I'd like to emphasize that in showing the obvious imbalance in protective equipment and offensive capability there is no intent to suggest that we should go on a massive buildup or retaliatory capabilities nor even to attempt to match the Soviets in all types of defensive equipment. Rather, it is our recommendation that we continue with our modest chemical program to fill a serious void in our capability and send a clear signal to the Soviets that we do not want chemical warfare, but we do have the capability to retaliate, if attacked and continue our defensive tasks. Hopefully, by continuing our program, we deter our would be aggressor and at the same time give our arms control negotiations a stronger position at the Round Table in Geneva. Thank you.

Senator WARNER. General Baker?

STATEMENT OF BRIG. GEN. THOMAS A. BAKER, U.S. AIR FORCE, DEPUTY DIRECTOR OF OPERATIONS

General BAKER. Sir, I will summarize the Air Force position very briefly.

Point 1. The weapons that we currently have in our inventory do not constitute a credible deterrent as viewed by the Air Force. If we were tasked to deliver these weapons in war today, we feel we would inflict token damage while suffering out-of-proportion losses as a result of limitations on the delivery of the present inventory.

We view the near-term solution to this problem as a continued development and procurement of a binary weapon in the form of Bigeye. We have redefined a requirement for that weapon as a result of assessment of the situation.

If, on the other hand, we are required to rely on protection alone, that is to say, we draw away from the deterrent aspect, we have in fact obtained a combat capability in a defensive role. However, that is an extremely limited capability and will continue to be severely limited until we can field a collective protection system in conjunction with our fixed installations around the world. Even then, we will continue to suffer a performance decrement if forced to operate from a contaminated base.

One comment on Congressman Bethune's reference to the item of trust where we must develop trust with our allies and our enemies. It occurs to me there is another element of trust, we have an obligation of trust to our Armed Forces, the people we command, that they be properly trained and equipped to fight in defense of this country. I thing we must view that element of trust in the same perspective as we view all the other trusts that are required.

Thank you.

Senator WARNER. General, a question to you.

With reference to your present aircraft which can carry chemical spray tanks, what is the operational envelope of that mission?

General BAKER. It will vary slightly with different aircraft. Basically the spray tank requires you to overfly the target at a relatively low level at, in today's terms somewhat slow air speed, offsetting only to get up-wind to allow the elements to provide you the proper coverage.

Our biggest problem tactically with the delivery is the fact that you must commit the aircraft to a very vulnerable environment.

Senator WARNER. From the standpoint of a young pilot flying that, would he view it almost as suicidal?

General BAKER. He would view that as suicidal. I can answer that very quickly.

Senator WARNER. A suicidal mission?

General BAKER. Yes, sir.

Senator WARNER. Admiral Barth?

STATEMENT OF REAR ADM. JOSEPH J. BARTH, U.S. NAVY, DIRECTOR, STRIKE AND AMPHIBIOUS WARFARE

Admiral BARTH. Mr. Chairman, in the Navy today we would find it very difficult to conduct carrier air, mine warfare, or amphibious operations from contaminated ships.

To be able to operate effectively in a toxic environment, we must be able to detect the chemical agents before they contaminate our ships, provide individual protection for our personnel and be able to close up those ships to form a protective envelope as well as be able to decontaminate after a chemical attack. We are pursuing an ongoing program to improve our defensive posture.

I might add here that contrary to what the previous witnesses said, we are presently unable to close up our ships to a degree which would afford us the safety that was suggested.

Senator WARNER. While I did not want to cross-examine my distinguished former colleague, I was somewhat taken aback by his observation.

Admiral BARTH. As to procurement of defensive chemical equipment, we are concentrating on providing items of equipment, such as masks and clothing, detectors, decontaminants, and antidotes for afloat forces with first priority being given to highly vulnerable amphibious units.

Chemical protective equipment in itself detracts from our ability to conduct combat operations. The encumbrance of the protective gloves and mask reduces manual dexterity and field of vision.

Furthermore, the protective garment insulates the body and increases the probability of heat-related casualties. This problem is especially acute in the high stress of combat operations and in hot areas abroad ship such as enginerooms and firerooms.

An effective defensive posture alone is therefore, not sufficient to insure our ability to operate at maximum efficiency in a chemical environment. Increased defensive readiness must be complemented with an effective deterrent to discourage an aggressor's first use of chemical weapons.

Mr. Chairman, the Navy offensive chemical warfare program is intended to provide such a deterrent.

In that the objective of the U.S. chemical warfare posture is deterrence, the Navy has been involved in the development of a better weapon—the Bigeye binary chemical bomb. A binary weapon generates a persistent agent from two nonlethal chemicals, hence the name "binary."

Although they are not more lethal than unitary weapons, we believe that binary munitions are the most sensible way to establish a realis-

tic deterrent because of their obvious advantages over the current unitary weapons in terms of safety, security, transportability, and deployment.

You are quite correct in your statement earlier that we have some very severe restrictions about the unitary weapons aboard ship and binary weapons, of course, would solve this problem for us.

That completes my unclassified statement.

Senator WARNER. Having some experience, myself, aboard ship, I just have the greatest skepticism as to whether or not you can devise any gear to operate in some of those spaces.

What has been your success today in test and evaluation of this equipment?

Admiral BARTH. In the equipment that we are talking about, particularly in the high-heat stress areas. as I mentioned, the engineroom and fireroom, you are talking about stay times in the order of perhaps 30 minutes.

Senator WARNER. Which means you would have to have a constant rotation of personnel and aboard a smaller ship, we don't have the inventory of people to man those watches. So we are really stressed in this concept to even think we can operate a ship in that type of environment, are we not?

Admiral BARTH. Yes, sir, absolutely.

Senator WARNER. I will have to look into it.

Admiral Davies talked about the very low probability of any engagement at sea with chemical weapons.

Does your study provide a different view?

Admiral BARTH. I would agree with Admiral Davies that we would not want to fight a war at sea in a chemical environment.

As to the probability of it, given the Soviet capability as we know it, we can't assume that way.

Senator WARNER. To the extent we can talk in open session, they certainly have the capability of taking the offensive in that area, have they not?

Admiral BARTH. Absolutely; yes, sir.

Senator WARNER. We are going to have to move along here.

Do you have any comment on the Bigeye program with respect to the Navy's participation?

Admiral BARTH. Mr. Chairman, the Bigeye program is, in my view, a solid program. I think the changes we have made in the program with regard to changing the R&D and the production schedule are the right thing to do. We are going in the right direction.

I have a high degree of confidence in the technical aspects of the bomb in the direction we are pursuing it now.

Senator WARNER. Thank you very much.

Now, general, first I wish to extend an apology to your troops and other services that have appeared today prepared to exhibit the present state of the art and our protective gear, but when I made a decision we are going to have to have a second hearing, I thought it would be wise to confine it to those elements.

Will you kindly pay the Chair's respect to the men who took the trouble to come this morning and gear up?

STATEMENT OF BRIG. GEN. GERALD G. WATSON, U.S. ARMY, DIRECTOR, NUCLEAR AND CHEMICAL DIRECTORATE

General WATSON. Mr. Chairman, I surely will. I think I can speak for those troops and say that their motivation is to support the readiness of the U.S. Army. They will be glad to return, sir.

In concluding my remarks, Mr. Chairman, again, I would like to express to you my appreciation for the support of this committee and the support that you have given the Army in correcting two large deficiencies, one being our defensive capability and the other our retaliatory capability.

The threat that we face today, Mr. Chairman—I think it is reasonably well agreed by all the intelligence community—consists of a rather large capability on the part of the Soviet Union expressed first in their doctrine in which it is very evident that this doctrine includes use of these particular weapon systems as a part of their force multiplier capability, and evidence of that rests in the fact that they have a rather substantial research and development program underway.

They have a force structure of 60,000 to 80,000 soldiers dedicated to that cause. They have a large number of different weapon systems that are capable of delivering chemical weapons. They have a stockpile that is forward deployed and exists in depot systems throughout the Soviet Union and they have a training program that is very active and very substantial in the chemical warfare arena.

So, when you take all of those things and put them together, from the Army's perspective, sir, you find the doctrine, the force structure, the training, the R&D, the weapons systems, and the deployment to support their doctrine.

Therefore, they present a rather formidable threat.

Several years ago, the Army put together a panel of general officers and we looked at that threat to see how we should better prepare our readiness against it. We looked at two major things, sir.

We looked at what we had to do in order to keep from losing. That put us on the defensive program because of our national policy of no first use and in looking at those things that keep us from losing, we invested heavily in our defensive program and for the past several years, we have been preparing our soldiers to survive in that environment.

Because there was no technology available and because we were entering an R&D program without any base, we had to buy off-the-shelf technology. We have done that, and in 1982, we issued to the Active Force their protective gear.

In 1983, we will complete Reserve Forces in issuing their protective gear for those who are deploying in the early deployment schedules.

In 1985, we will complete all of the Reserve forces in issuing them their protective gear.

In 1986, Mr. Chairman, we should have our reserve stocks built back up to an acceptable level. Our effort has been concentrated on the defensive program for force survivability. Using today's technology we have ended up getting equipment that still is very degrading to the Army if we have to operate in that environment.

It is our judgment today, because of the modeling and the war gaming that we have done, and the intelligence information that is available to us, that we can't live in the same environment with the equipment that we have if we are going to be effective at all in deterring this rather massive capability that I have portrayed for the Soviet Union.

The second thing that we did, sir, and the thing we have been unsuccessful on, is that we looked at doing those things that contribute most to winning. It was our collective assessment that that requires us to have a retaliatory capability and we have been unsuccessful in getting that.

Today, that is the single greatest deficiency in our force because we only have the ability to deliver weapons with the ground systems against the Soviet Union out to a range of 12 to 15 kilometers beyond the front lines.

They have the capability, on the other hand, to hit us 500 kilometers deep. That includes our airfields, our logistics lines, our ports, as well as our front lines.

Not only do they have systems with ranges to do that, they have the weapon systems in place that provide that capability to them. So, we need to continue our program of retaliatory modernization, especially with the 155-millimeter munitions, which gives us an increase in the range for the close battle area and the deeper weapons with persistent agent, the Bigeye bomb, that the Air Force and Navy will support us with.

U.S. REDUCES INVENTORY

In concluding, Mr. Chairman, and addressing myself to Congressman Bethune's point that we are on the moral high ground, I would totally concur in that observation. I think we are on the moral high ground.

But, I would only say that in the 14 years that he talked about that we were on the moral high ground, we have destroyed 7,000 tons of agent in our inventory and at the same time we have not seen the Soviet Union decrease their production at any of their production sites.

We have seen them increase storage at their depots. We have seen them increase their force structure. We have also seen them increase their decontamination capability.

So, while we have been on that moral high ground, the asymmetry between our forces has increased to the point where we are at very high risk today.

Thank you, Mr. Chairman.

Senator WARNER. I thank you.

One question briefly.

The scenario that you gave us in the classified session this morning, which I think I can safely say without violating classification, clearly indicates that our Armed Forces today in Europe in the foreseeable future are at substantial personal risk, quite apart from the military consequences of a setback.

That imbalance in the strategic, that is, the chemical warfare capability and the offensive capability of the Soviet, directly relates to this first use of nuclear weapons on the tactical level.

Am I not correct in that?

Dr. Gold, would you like to respond?

Dr. GOLD. In that your implication is if we cannot have a deterrent against this type of conflict at this level, we have no recourse——

Senator WARNER. A field commander, given the losses portrayed in the hypothetical situation we studied this morning, would at a very early point in time, have to seek from higher authority a judgment as to whether or not he should continue to sustain these unacceptable, in my judgment, high level losses or be forced to retaliate with a tactical nuclear weapon.

Isn't that the bottom line?

Dr. GOLD. Absolutely. I have great concern that the asymmetry in the chemical arena in essence lowers the nuclear threshold, something we want to avoid.

Senator WARNER. General, do you wish to add to that?

General WATSON. I would fully concur and only add to that, sir, this observation.

It does lower the nuclear threshold. But when we look at the conventional forces today we see a very disturbing trend in the increase in artillery and tanks and mechanized systems. We see the same thing occurring in the nuclear weapons, the short-range nuclear weapons of the Soviet Union.

So, looking at our alternatives, our alternatives of lowering the threshold and reverting to nuclear weapons still leaves us far short of the confidence that we need in order to succeed. Reverting to nuclear weapons where we no longer have a distinct advantage also gives us very much of a disadvantage, sir.

So, in the lowering of the threshold, while it is dangerous, we move from one level of danger to another.

The committee members have some questions to be answered for the record and I will insert them at this point.

[Questions with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN W. WARNER

CHEMICAL WARFARE

Senator WARNER. Dr. Gold, the Wall Street Journal in an editorial on April 4, which will be inserted here, noted that, in a recent winter exercise, allied wargamers played selected Soviet chemical attacks against allied military sites.

The report suggests that such attacks were devastatingly effective in throwing into chaos rear areas of the European battlefield and thereby dramatically affecting NATO defensive capabilities.

Would you comment in detail on this exercise? Do the Soviets today have a capability to execute an attack whose primary purpose is psychological?

Does the United States have a credible ability to retaliate in kind with chemical weapons?

Is there evidence in Soviet doctrine and exercises to suggest that early and especially cynical and cruel use of these weapons is countenanced?

[The Wall Street Journal editorial follows:]

[From the Wall Street Journal, Apr. 4, 1983]

REVIEW AND OUTLOOK: STRAINING FOR DEFENSE CUTS

As Congress returns to town, battle lines are obviously being drawn over the Reagan military budget. Mr. Reagan has requested important increases in defense spending, and in percentage terms the proposed increases look like lucrative targets for cuts. But in fact his critics are having trouble coming up with specific cuts that both amount to large sums and look prudent.

Much-discussed strategic programs like the MX missile are stretched out over many years, and do not represent big potential savings in the year immediately

at hand. One can of course argue about details and priorities; we ourselves would like to see more of the defense money diverted to super-modern, super-accurate conventional weapons. But to get big savings, to make any kind of dent in the budget deficit or to free monies for social programs, you need to cut modern, conventional forces, and years of neglect make this difficult.

To show how far the critics have to reach, take them at their most cogent—the detailed critique of the Reagan budget prepared by McGeorge Bundy, Robert S. McNamara, Cyrus Vance and E. R. Zumwalt. Surely these are people who should be able to find waste in budget proposals, so the logic of some of their proposals is worth examining, and if you read their letter you find some pretty remarkable passages.

They propose, for example, to save $5 billion in fiscal year 1984 by slowing the acquisition of modern munitions for the European theater. As justification for this cut the letter does not offer the need to acquire even more modern systems he and we would both support. This of course would only redirect money, not save it. So instead, the letter proposes that the Reagan goal of a 90-day stock of ammunition should be cut in half because "it does not make sense for us to procure stocks for 90 days while our allies have stocks for only 45 days." We could save even more if we persuaded the allies to surrender after 15 days.

The logic, so help us, runs as follows: The Soviets can already beat us conventionally, therefore, they have no need to go chemical, therefore, we don't need a chemical deterrent, therefore, the proposed spending on binary weapons is wasteful and can be deleted.

The last time we heard, the Soviet Union had conventional superiority over the Afghan rebels, not to mention the Hmong tribesmen. This seems to have conferred on immunity to chemical and biological attack on neither the Afghans nor the Hmong. Anyone who wants to shove aside the need for a truly usable chemical deterrent ought to take a look at the NATO wargame conducted as a planning exercise this last winter and reported in The Wall Street Journal/Europe. In this hypothetical but carefully prepared exercise, those acting out the Soviet role launched a few chemical attacks—for example, on Greenham Common, a potential cruise missile base in Great Britain recently in the news as a site of protests against NATO weapons. These attacks induced terror nad panic in the European civilian population, as they have among the Hmong. Some three to four million Germans jumped in cars and tried to flee, clogging the autobahns. Because of the congestion, NATO conventional forces could not reach their battle stations.

We can be thankful that the NATO planners are taking seriously the implications of the use of biological and chemical warfare in Southeast Asia and Afghanistan, and have correctly identified its use as a terror weapon. It is difficult to understand how, after recent experience, the chemical threat could still be treated in such cavalier fashion by people as serious as the Bundy-McNamara-Vance-Zumwalt group.

More broadly, what does all of this say about the exercise of cutting the defense budget? Surely it is to such people one would look for a serious critique of the Reagan proposals. Yet in trying to justify big savings in the Reagan proposals, even this illustrious group starts to sound fatuous. This ought to tell us that large as the percentages are, the Reagan defense increases are by no means wild-eyed. One can argue about the priorities, but if no better case can be made, big savings are not going to be made without real risks to national security.

Dr. GOLD. [Deleted.]

Yes. The Soviet Union today has the capability to launch virtually any kind of chemical attack for whatever reasons they believe are necessary to achieve their desired objectives. [Deleted.]

No, sir. Our chemical weapons stockpile is seriously deficient in terms of military capability, and would not represent a credible deterrent to Soviet chemical weapons use in some future conflict. The most serious deficiency is the lack of an effective capability to deliver persistent agent against targets beyond artillery range. The only existing capability is a small number of aircraft spray tanks, whose delivery parameters render the aircraft extremely vulnerable to even modest air defenses.

[Deleted] our similar facilities are threatened by a wide variety of missile and aircraft delivered chemical systems capable of forcing prolonged operations in a restrictive and degrading protective posture. This deficiency is critical, and the Bigeye bomb is specifically designed to redress this lack of capability.

Our understanding of Soviet doctrine, with its emphasis on surprise and rapid offensive maneuver, and their training activity lend credence to the possible use of chemical warfare to achieve their objectives. Both the recurring events in Afghanistan and the Soviet's extensive CW capability suggest that early-use cannot be discounted.

NEUTRALIZING CHEMICAL ATTACKS

Senator WARNER. Is there anything in the U.S. or NATO planning for chemical defensive measures which would neutralize the effects of such attacks?

What would be required in terms of financial resources and changes in NATO policy to make such neutralization of Soviet anti-population chemical attacks possible?

Dr. GOLD. The United States and NATO are committed to improving chemical protective capabilities; however, there is nothing on the horizon that could neutralize the effects of chemical attacks on military targets. All present or foreseeable chemical protective equipment and procedures result in a major performance decrement for individuals and units operating in a contaminated environment. This decrement can be 50 percent or more depending on the type of unit and, currently, sustainability is severely limited. If all research and development programs are totally successful, the best that can be hoped for is to reduce, but not eliminate, the performance decrement and to increase sustainability at that reduced performance level. We will seek a breakthrough in obtaining antidotes or prophylaxes for known threat agents through an expanded medical R&D program using the most modern technology. However, even if successful, we would continue to have to retain degrading physical protective equipment and measures to be protected from potential agents for which we still had little medical protection. Today, against the chemical protective and retaliatory capabilities of NATO, the Soviets would gain a force multiplier effect of [deleted] by employing chemicals. This situation will not change unless we acquire the capability to force the Soviets to have to operate their forces, in depth, in a similar restrictive, degrading protective posture. We must have the capability to deliver persistent chemical agent beyond artillery range.

Given the situation for military forces, it is impossible to visualize neutralizing Soviet chemical anti-population attacks. Any attempt would require massive investments in protective clothing; shelters; decontamination; medical facilities; and extensive, repetitive training for the entire populaton. Such an effort would constitute a major burden on the nations involved and would have limited prospects for success. We have no evidence to indicate either that the Soviets share our concerns about the impact of chemical warfare on civilians or that they would be constrained by the prospect of massive civilian casualties among their enemies. In fact, evidence from Southeast Asia and Afghanistan is that civilians have often been specific targets of Soviet, or Soviet-sponsored, chemical use.

We believe the only way to reduce the probability that the Soviets will employ chemical weapons is to acquire a credible deterrent, so they will perceive no advantage from such use.

IMPLICATIONS OF BIGEYE PROGRAM DIFFICULTY

Senator WARNER. Dr. Gold, does the evidence of technical difficulty in the Bigeye program which has prompted you to recommend postponing the initiation of production of this weapon indicate a larger problem of competent management in the U.S. chemical preparedness program?

As you know, some have in the past cited the problems of the development of a new chemical protective mask to make the point that other elements of this country's effort to deter chemical war, in all likelihood, suffered from similar program mismanagement. How do you respond to this allegation?

Dr. GOLD. I believe the current actions on the Bigeye program reflect responsible, conservative, and competent management decisions. The Bigeye bomb, even with the technical problem described during the hearing, is far safer and more militarily effective than any chemical weapon in our inventory. In one case out of several thousand, a mixed Bigeye might not be able to be dropped. necessitating return to the base with toxic agent; or, in extreme cases, excessive pressure might cause the case to fail, releasing part of the agent to the ground or contaminating the aircraft. In contrast, current unitary air delivered spray munitions contain toxic agent 100 percent of the time, contaminate the delivery aircraft 100 percent of the time, and continue to dribble agent following dis-

semination 100 percent of the time. However, we have a strong obligation to make the Bigeye as safe and as militarily effective as possible; consequently, we have decided, in spite of the critical need, to slip the program and fix this problem. The only legitimate criticism of this decision might be that it is too conservative in the face of the acute military need for the weapon.

Regarding the overall quality of management in chemical warfare programs, it is important to remember recent history. This nation intentionally deemphasized chemical warfare during most of the 1970s in the belief that we could negotiate away the problem. The research, development and acquisition, training and doctrinal, and management base for the chemical program was essentially dismantled. When this nation realized that the Soviets had not shared our restraint and that our forces faced a threat which they were totally unprepared to handle, it was necessary to field a military capability with an inadequate supporting infrastructure. To illustrate the severity of the problem, it is now possible to say in unclassified form that as late as 1977, the U.S. Air Force could not launch a single combat aircraft under chemical attack conditions. Clearly, we could not wait the years necessary to reestablish an adequate technical and management structure before we took action. There is no one in the Department of Defense that will claim that no mistakes were made and no money was wasted. However, today, although at considerably reduced effectiveness, U.S. forces can survive and fight in a chemical environment. That is an accomplishment of which we are very proud.

The effort on a new chemical protective mask is a case in point. The initial effort on a new mask was initiated before 1970, but effective development was slowed to an inefficient level during the 1970s, resulting in compromises in fulfilling requirements. Today, the mask is a valuable addition for certain needs, but does not meet the most stringent Army requirements. The hard-nosed management decisions made recently by the Services to cut losses and build upon success reflect the improvements in management occurring as emphasis is again placed on preparing for the chemical threat.

This is not to say that we are satisfied with poor management. We are not, and we have taken and are continuing to take steps to improve. There are now established chemical focal points in OSD, the JCS, the Services, the joint commands, and the major subordinate Service commands. There is an established DOD CW Steering Committee, and there are several interagency groups. We have clarified the objectives and guidance for the military, and we closely review their budgets and programs. We have undertaken several special reviews on subjects such as Bigeye, the current stockpile, demilitarization, and the development and acquisition process. At my request, the American Defense Preparedness Association is sponsoring this June a working conference on chemical materiel acquisition management to assist in further improvements. We are making progress in reestablishing a sound managerial, technical, and doctrinal basis for chemical programs and expect these to lead to greater efficiency and military capability.

IMPACT OF THE HATFIELD AMENDMENT

Senator WARNER. Dr. Gold, last year, in the course of its action on the fiscal year 1983 Defense Authorization bill, the Senate adopted unanimously an amendment offered by Senator Hatfield which would have made clear the fact that the United States Government in pursuing the binary modernization program, was not bent on vastly increasing the size of the American chemical stockpile.

This amendment would have required that for every 155-millimeter binary shell introduced into the inventory, one existing, usable unitary shell would be rendered militarily useless.

Would you comment on the compatibility of that approach with the administration's chemical modernization program?

Should the committee see fit to recommend the approval of the requested funding for the binaries in fiscal year 1984, would the Administration support the incorporation of language similar to that of the Hatfield amendment into the Authorization Bill?

Dr. GOLD. The Hatfield amendment represented one approach to limiting the size of the U.S. chemical weapons stockpile. We accepted the amendment and certainly do not propose to produce a binary stockpile which approaches the size of the present unitary stockpile. Further, we do not intend to produce binary weapons to meet the requirements of allies unless the allies articulate that re-

quirement to us. However, the specific requirement to permanently render useless for military purposes a serviceable artillery shell from the existing stockpile as new rounds were produced would have led to a cost increase over that projected for the chemical demilitarization program. The term "render useless" was specifically selected to avoid putting undue pressure on the chemical demilitarization program which, correctly, should concentrate first on the most hazardous items in the stockpile rather than the less hazardous artillery and mortar projectiles.

Following passage of the Hatfield amendment, the Army informally investigated a variety of options for rendering artillery ammunition useless. A number of the options would have made subsequent complete demilitarization more difficult and were discarded. Also discarded were those that involved any stress on the shell body itself. Of the options remaining, the least expensive would have cost from $20–$30 per shell with no reduction in the ultimate demilitarization cost. We would prefer to reach some accord as to the number of rounds to be built without a costly linkage to the current stockpile. As discussed in the testimony, the current unitary stockpile contains about [deleted] agent tons and about [deleted] munitions and 18 munition types. The portion we consider to be useful contains about [deleted] munitions, [deleted] agent tons, and 7 munition types. The inventory objective for the 155mm binary projectile and the Bigeye bomb is about [deleted] munitions, and [deleted] agent tons, and this objective would not be reached until [deleted]. Also, [deleted] there will be a number of active demilitarization plants working to dispose of the unitary stocks.

In summary, we believe a considerably smaller stockpile can be adequate for deterrence provided it contains the proper munitions. We do not have the need or desire to attempt to match the Soviets round-for-round. What we do need it to be able to impose a restrictive, protective posture on them in depth. We cannot do this today. To do so, and thus have a credible deterrent, requires modernization.

CONUS-BASED CHEMICAL MUNITIONS

Senator WARNER. Dr. Gold, you may recall last year that considerable interest was expressed by members of this Committee in the issue of airlift requirements for relocating CONUS-based binary chemical weapons to Europe in the event of an emergency.

The point that I think was often overlooked is the fact that today prodigious amounts of airlift would be required to relocate the necessary quantities of U.S. unitary munitions based in the continental United States.

Would you try to give us a feel for the relative requirements for moving such munitions—both unitary and binary—and the safety considerations, and other logistics factors that need to be taken into account?

Dr. GOLD. It is possible to crisis deploy both unitary and binary chemical munitions: however, binary munitions pose less difficulty because they do not contain toxic agent. Thus, binary chemical munitions can be handled similar to conventional amunition of equivalent explosive content. Binary munitions do not require accompanying technical escort personnel and decontamination equipment.

For 155mm chemical artillery projectiles the airlift requirements are essentially equal for the unitary and binary versions. In airlift of munitions, the limiting factor is usually weight rather than volume. Thus, a C–141 can carry more of the lighter binary shells than unitary shells. On the other hand, separate lift is required for the second binary canister. For air-delivered munitions, the Bigeye bomb has a decided advantage over the current persistent agent munition, the TMU 28/B spray tank. The TMU–28/B, a thin-skinned weapon, weighs 2,000 lbs. and comes in a 4,000 lb. shipping container. Each spray tank can be used against only one target and covers a large area. The equivalent weight of Bigeye bombs provides the flexibility to engage a number of targets and is more precise in its application, reducing the risk of off-target contamination.

The following table shows the number of chemical rounds (binary and unitary) that could be carried per C–141B sortie to Europe. It also, for example only, shows the number of C–141B sorties required to transport a significant quantity of munitions to Europe. The computation includes airlift for technical escort and decontamination support for unitary munitions and for the second component of binary systems.

Type	Number of rounds	Number of sorties to move (x number of rounds)
155mm, unitary	504	40 (20,000)
8", unitary	246	82 (20,000)
155mm, binary	608	40 (20,000)
MC-1 bomb, unitary	66	16 (1,000)
TMU-28/B spray tank, unitary	6	167 (1,000)
Bigeye bomb, binary	60	19 (1,000)

NOTE.—In terms of military utility/role and agent fill, the Bigeye bomb must be compared with the persistent TMU-28/B spray tank. They are the only means available of forcing adoption of long-term restrictive protective measures on military targets beyond artillery range.

ALLIES' PROBLEMS WITH DEPLOYMENT

Senator WARNER. Dr. Gold, you will recall that in the congressional action on the fiscal year 1982 Defense Appropriations bill, the Department was required to report on a number of issues with respect to the chemical warfare program.

One subject was broadly perceived to have been inadequately addressed by the Department—the degree to which our allies supported the development and production—and the deployment in Europe—of binary munitions.

What additional work has been done in the area of consultation with the allies and coordination of American policy with respect to such U.S. initiatives?

Is further work in this area planned?

Dr. GOLD. At this time, we have no plans to increase the overseas deployment of chemical weapons, binary or unitary, and, thus, have not broached this subject with European or any other allies.

Deterrence does not imply that binary weapons must be deployed in Europe or elsewhere overseas. A credible retaliatory capability with weapons stored in the United States is far superior to the present situation where the chemical stockpile totally lacks vital capabilities. Although forward deployment of munitions can enhance their value, the procurement of militarily useful chemical munitions will help restore an adequate level of deterrence even without such deployment. It would take years to acquire an adequate stockpile, whereas retaliation with an adequate stockpile stored in the United States could take place within hours or days. Further, Europe is not the only area where we face a chemical threat. Recent history clearly shows that we must be prepared for chemical warfare anywhere we might face a Soviet or Soviet supported force. A stockpile stored in the U.S. provides good flexibility for worldwide crisis deployment options.

U.S. chemical warfare policy and objectives are totally consistent with NATO policy and objectives, and our allies have been kept fully informed about our program as it has progressed. They have found no need to comment specifically, because they accept that our program is a U.S. effort undertaken unilaterally to modernize our stockpile. Moreover, we have assured the allies that we will consult fully with them before any changes are made in deployment in the European theater. This gives them full confidence that no additional forward deployment will take place in Europe without the specific host country participating fully in any decision.

RELATIVE ABILITIES OF SOVIET/U.S. FORCES IN DEFENSIVE POSTURE

Senator WARNER. Dr. Gold, it is often suggested that the relative inferiority of Soviet individual protective gear (i.e., butyl suits which impose considerable heat-stress on the wearer) means that the Soviets would be even less well prepared to fight in a chemically-contaminated environment than their U.S./allied counterparts.

Would you comment on this assertion?

Looking at all the relevant factors—collective protection, decontamination, chemical recce as well as the probability that, as the Soviets will be the first to lay down a chemical barrage, they will be able to conduct their offensive operations knowing where and what type of chemical weapons have been used—is there any question in your mind as to who has the superior capability to fight in a chemical environment?

Dr. GOLD. The Soviet forces are undeniably the most capable in the world of employing chemical weapons and operating in a chemical warfare environ-

ment. Their capability is well suited to their doctrine and to counter the current minimal threat we pose to them. Chemical use would be at the Soviet's choice, along the front lines and in their enemy's (our) rear areas. The Soviets have invested heavily in the chemical protective capabilities required to employ chemical weapons. Their maneuver forces can traverse or locate and bypass chemical contaminated areas, and they have invested heavily in decontamination capabilities throughout their force structure. They also emphasize nonpersistent agents in their short-range systems (which would dissipate by the time their forces arrived) and persistent agents in their long-range systems.

The Soviets do have chemical protective vulnerabilities, which can be exploited. The current chemical protective equipment provided to Soviet forces does not appear to be well suited for prolonged combat in a contaminated environment. Their suits are made of rubber, which imposes extremely severe thermal burdens at even moderate temperatures. Without cooling systems, acceptable wear times for that type of suit range from approximately two hours in cold weather to less than 30 minutes in hot weather due to dehydration and heat exhaustion. Soviets masks provided good protection, but greatly limit vision, and only NOCs' and officers' masks have a communication capability. Also, observed masks do not have a drinking capability; thus, adding to thermal problems.

Pact doctrine is to pull units off line for decontamination and return them to action when decontamination is complete. If front line and second and third echelon forces could be attacked, contaminated, and forced into a prolonged protective posture, the debilitating effects of chemicals could be extremely significant. Similarly, rear targets such as air bases, depots, and transhipment points are vulnerable to chemical attacks. Unfortunately, we do not have a viable capability to attack targets beyond artillery range with persistent agent. This leaves Soviet/Warsaw Pact forces beyond artillery range free to operate unencumbered by chemical protective equipment and procedures, while our forces (from front to rear) face a serious chemical threat. Rather than deterrence, this situation gives the Soviets a strong incentive to use chemical weapons.

CHEMICAL WARFARE

Senator WARNER. Dr. Gold, would you give us an update on the steps that have been taken by our allies since this time last year to enhance their preparedness to defend against a chemical attack? Are our allies appreciably better prepared today to contend with the possibility of chemical attacks against their personnel—particularly in the forward sectors in Germany—in the event of Soviet chemical attacks?

Dr. GOLD. We currently do not have the level of detail available to quantify the NATO chemical defense improvement over the past year. However, be assured that progress is being made. The NATO allies recognize the seriousness and scope of the chemical threat, and are committed by the NATO Long Term Defense Plan to improve their chemical defenses. There have been improvements in recent years in the overall defensive capability of NATO forces, particularly in the ability to survive an initial chemical attack. These improvements are more noticeable for those forces defending the central region of Europe. On the flanks it is unlikely that any country will have its full complement of individual and unit protective equipment until late in the 1980s, for some countries it may even be later. Progress has also been made in other areas such as improved training and inspection standards and updating concepts and doctrine. However, progress is tempered by the large gap which must be bridged, and fiscal realities. Thus, the overall ability to conduct chemical or biological defensive operations remains unsatisfactory. The inability to conduct sustained, efficient operations in a chemical/biological environment remains the most pressing problem. Attainment of this capability is a longer term proposition and requires upgrading our capabilities in several areas to include individual protection, detection and monitoring, small and large area decontamination, collective protection and medical preparedness. Several countries have programs underway to solve these problems and develop the necessary equipment.

STOCKPILE MONITORING

Senator WARNER. Dr. Gold, I understand that you have underway now a study aimed at assessing the condition today and expected future status of munitions in our chemical inventory.

How far along is this study?

What information can you give us about its findings to date?

Dr. GOLD. The current stockpile has small military deterrent value due to its lack of an effective capability to deliver persistent agent beyond artillery range and due to the relatively few munitions in the stockpile that are useful on a modern battlefield. Therefore, the condition and status of those relatively few munitions are of critical importance in assessing our deterrent deficiences and the urgency of need to complete planned binary production.

There is no question of the disadvantages of the current unitary chemical nerve agent artillery projectiles which can be fired by currently available artillery, i.e., 155mm and 8-inch howitzers. The mix of agent is not ideal in that there is currently a high percentage of persistent VX versus the nonpersistent GB (which will be in the proposed M–687 binary round) which is best for short range use. The current 155mm unitary munitions cannot be fired to the full range of the new 155mm howitzer. There are numerous other operational, logistical, safety, and surety advantages of the M–687 as opposed to the existing items. Nevertheless, the total quantity of artillery projectiles is in the range of sufficiency (for U.S. forces) and actually is higher than the planned acquisition quantity for the binary projectile. Therefore, there remains some military capability, which needs to be modernized, but which provides some deterrence so long as the projectiles are usable and safe to fire.

The significant questions regarding chemical artillery shells are how long will the existing shells remain usable, and are they now (and will they remain) safe to fire? The useful portion of the artillery stockpile is the 155mm and 8-inch projectiles. The newest of these shells was filled in 1968, and the oldest in 1955. The chemical fills are unstable compounds which deteriorate over time. Sampling has shown that the fill has degraded, although the 155mm and 8-inch fills still meet acceptable standards. The degradation reaction is self-catalyzing in that the degradation byproducts foster the breakdown of the agent. Stabilizers were added to the agent during filling, but when they are consumed, the degradation rate will accelerate. The degradation byproducts are corrosives and have been in contact with the internal shell surfaces. If the internal structure of the shells has been weakened, it may be unsafe to fire them, and there has been no stockpile confidence test firing since 1969.

The questions of the present and future usability of the artillery stockpile are critical. To address these questions, we have assembled a highly qualified panel of experts on chemistry, corrosion, and explosives to assess the evidence and provide their judgments and recommendations. The panel is still at work, and actions have been taken to obtain additional data requested by the panel. The panel is continuing to review data and expects to have final findings and recommendations this summer.

IMPACT OF MAINTENANCE PROGRAM

Senator WARNER. Dr. Gold, would you describe the effect that the chemical maintenance program has had on increasing the numbers of serviceable weapons in the inventory?

How many such weapons are there today and how does the fact that the numbers of such serviceable munitions has been substantially increased over the past two years affect the requirement for procurement of newer systems such as the binary 155 round?

Dr. GOLD. The chemical maintenance program has increased the number of useful artillery rounds ready-for-issue by over [deleted] rounds during the past year, leaving some additional [deleted] useful artillery rounds which remain repairable to ready-for-issue status. This program does increase our readiness status in the near term, but does not remedy the fundamental flaws of the current retaliatory stockpile: the lack of an ability to deliver a persistent agent beyond artillery range; and the lack of modern artillery range capability, the risk in handling, and the deterioration of existing unitary chemical artillery rounds.

The terms "serviceable" and "unserviceable" have caused some confusion in the past. The Army ammunition community uses these terms technically for certain classes of maintenance condition codes which are assigned to all ammunition. In assessing our chemical warfare deterrent posture, we believe it is clearer to use the terms "ready-for-issue," "repairable," and "nonrepairable." The Army technical use of the term "serviceable" would include only the ready-for-issue category and the term "unserviceable" would technically include both repairable and unrepairable categories. For deterrent purposes, i.e., for potential use on the battlefield, both the ready-for-issue and the repairable category munitions are important and are what we use in estimating capabilities and produc-

tion requirements. The unrepairable munitions are totally useless and suitable only for demilitarization. The chemical maintenance program does not change the total number of ready-for-issue and repairable items, but only changes the repairable to ready-for-issue. Indeed, the only way that the total of ready-for-issue and repairable munitions changes (without new production) is when leaking or other deterioration is detected, placing the munition into the unrepairable category, or when the munition is determined to be obsolete for battlefield use (e.g., the removal of the 155mm gun from field service in the 1970s made 155mm gun chemical munitions obsolete).

To fully assess the deterrent capability of our stockpile, it is also important to distinguish between the ready-to-issue and repairable munitions which are useful to the military on the modern battlefield and those which are not useful. As shown on the enclosed charts (one classified, showing numbers of munitions and one unclassified, showing percentages of the total ready-for-issue and repairable munitions), a majority of the munitions currently repairable or ready-for-issue are not militarily useful, although not yet declared obsolete.

The large number of 105mm howitzer projectiles are not useful because there are only a few dozen 105mm howitzers still in service. The short range 4.2 inch mortar is also an obsolescent system. The land mines and short-range mustard munitions are not effective on a modern mobile battlefield, particularly considering the high freezing point of the mustard agent. The spray tanks are the only available means of delivering persistent agent beyond artillery range, but they are extremely ineffective systems when opposed by modern air defenses.

In summary, the maintenance efforts does not affect the need for new weapons. No amount of maintenance can create a viable deep attack persistent agent capability out of artillery and nonpersistent bombs. That requires the production of new weapons, like the Bigeye bomb. Further, maintenance cannot assure a usable chemical artillery stockpile into the future. The degradation is internal, and maintenance can only address external factors such as packaging, rust, paint, and removable components. Also, maintenance cannot make those rounds firable to the maximum range of the new tubes. They are not aerodynamically and ballistically the same as modern artillery shells, and they cannot withstand the higher propellant charges.

CHEMICAL MUNITIONS STOCKPILE

MUNITIONS STATUS	MILITARY UTILITY			
	NOT USEFUL		USEFUL	
		NO. AGENT TONS		NO. AGENT TONS
REPAIRABLE	105mm NERVE LANDMINE VX MORTAR (MUSTARD) 105 (MUSTARD) 155mm MUSTARD SPRAY TANK, VX	(DELETED)	155mm NERVE 8" NERVE 750 LB. BOMB, GB	(DELETED)
		NO. AGENT TONS		NO. AGENT TONS
READY FOR ISSUE	105mm NERVE LANDMINE VX MORTAR (MUSTARD)	(DELETED)	155mm NERVE 8" NERVE 750 LB. BOMB, GB 500 LB. BOMB, GB WETEYE, GB	(DELETED)

CHEMICAL MUNITIONS STOCKPILE USABILITY MATRIX

(% OF WEAPONIZED AGENT TONS, NOT INCLUDING UNREPAIRABLE/OBSOLETE)

MUNITIONS STATUS	MILITARY UTILITY	
	NOT USEFUL*	USEFUL**
REPAIRABLE	55%	9%
READY FOR ISSUE	9%	27%

*ALL MUSTARD, 105mm ARTILLERY, MINES, SPRAY TANKS.
**155mm AND 8-INCH NERVE AGENT ARTILLERY PROJECTILES AND NONPERSISTENT BOMBS.

COSTS OF THE CHEMICAL MODERNIZATION PROGRAM

Senator WARNER. Dr. Gold, there has been considerable confusion in the past about the total costs associated with modernizing our chemical deterrent.

Would you give us now and in greater detail for the record an idea of the total costs associated with the procurement of new chemical munitions?

How does this compare with the costs required for demilitarizing existing chemical stocks?

Do you believe such costs of demilitarization will have to be borne ultimately regardless of whether or not the decision is made to proceed with modernization of the chemical arsenal with binaries?

Furthermore, what is the projected cost over the five-year defense plan for procurement of defensive equipment, decontamination gear, et cetera?

Is it not true that such investments would, in all likelihood, be made whether or not the decision to proceed with binaries is affirmed by the Congress?

Dr. GOLD. The total procurement cost for the 155mm and Bigeye binary munitions is expected to be approximately $1.5 billion, with the last of the funds being for Bigeye in fiscal year 1990. This would procure the U.S. forces requirement for these weapons. Additionally, approximately $250 million will be required for production facilities and equipment.

The cost of demilitarizing the existing stocks of unitary agent and munitions has been estimated to be as high as $4 billion. The latest Army estimate is slightly less than $2 billion. The binary program has little impact on the demilitarization program. Ninety percent of the unitary stockpile has no military utility, unless the bulk agent is used to produce new unitary weapons, and can be demilitarized independent of a binary decision. The remaining 10 percent, the 155mm and 8-inch nerve agent ammunition and the bombs, are useful and would not be demilitarized until they lose their utility or some new system is available. Ultimately, the entire unitary stockpile must be demilitarized in any case.

Over the 5 year defense plan, we expect to spend about $5 billion on chemical protection. These investments will need to be made whether or not Congress approves the binary program. They will also need to be made regardless of whether we are successful in achieving a complete, verifiable chemical weapons ban. In fact, if we do achieve a ban or if Congress does not approve the binary program,

these costs might be significantly higher. In the first case because they would represent the only insurance against undetected cheating, and in the latter case, because we would have to plan on an enemy with a powerful incentive to use chemical weapons and no fear of meaningful retaliation. Such an approach could cost many billions and would always leave our forces at a distinct disadvantage.

IMPACT OF PRODUCTION DELAY ON DEMILITARIZING

Senator WARNER. Dr. Gold, what impact, if any, would you expect a further decision by the Congress to defer production of new binary munitions to have on the program for demilitarizing older and obsolete weapons?

In your judgment, can such delay be safely engaged in?

Dr. GOLD. A further decision by Congress to defer production of new binary munitions will have no effect on the demilitarization program until at least the early 1990s. As stated earlier, 90 percent of the stockpile has no military utility, unless we were to produce new unitary munitions, and can be demilitarized independent of a binary decision. The first lethal items scheduled for demilitarization are the M–55 rockets. These items are totally useless; the launchers have long been out of service. It will take until the early 1990s (on the present schedule) to dispose of them.

The unitary stockpile has an excellent safety record, and we take extreme measures to maintain safe conditions. However, the items are highly lethal and they are old. It would be irresponsible for us not to proceed with eliminating at least that portion of the stockpile which poses no hazard to our enemies, only to ourselves.

SOVIET ATTITUDE TOWARD CIVILIAN DEATH IN WAR

Senator WARNER. Dr. Gold, from your understanding of Soviet war-fighting doctrine, does concern about the loss of civilian life in Western Europe due to chemical weaponry, nuclear attack, or other causes, appear to be driving influence in the development of Soviet war plans or weapons systems?

In other words, is the NATO concern about collateral damage mirrored by the Warsaw Pact?

Can we, in your judgment, rely upon the risk of Western European civilian casualties to deter the Soviets from exploiting such weapons if the employment of such weapons would have military utility to them?

Dr. GOLD. There is no indication from history, recent behavior, plans, doctrine, or weapons systems that the Soviets would be deterred from chemical use by the prospect of massive civilian casualties among their enemies or allies. Their behavior in Afghanistan and Southeast Asia indicates that they are not deterred from using chemical and toxin weapons by the prospect of civilian casualties. Indeed civilian casualties may be the prime objective in many of these attacks. The Soviet Union is using chemical and toxin weapons against villages in Afghanistan and sponsoring such use in Southeast Asia.

We believe the only way to prevent such attacks is to convince the Soviets they have nothing to gain from chemical use. We can do this if, along with improving out protective posture, we attain a capability to force their military units to also operate in a contaminated environment with all the associated inefficiencies and degradation.

DEFENSE ISN'T ENOUGH

Senator WARNER. To the military witnesses: In years past, military officers testifying before this subcommittee on the issue of chemical warfare, have stressed the essentiality, in their respective views, of the United States maintaining a credible retaliatory capability if it is to deter the use of chemical weapons against American armed forces personnel.

There has been no disagreement that defensive measures alone are insufficient to provide such deterrence.

Would each of you comment on your views on this matter and the degree to which it continued to represent the best military judgment of what is required to preventing chemical war?

AIR FORCE

General BAKER. If our overseas bases were attacked today with chemical weapons, the Air Force is trained and equipped to meet the attack and to continue the fight but at a degraded level of effort. Upon attack warning, we fully

suit-up in our chemical defensive gear and place the maximum number of non-mission essential personnel into collective protection shelters if these facilities are available. As fatigue and frustration sets in, we try to rotate our work force but there are obvious manpower limitations.

During November 1980, the Air Force conducted an evaluation of the 50TFW at Hahn AB, Germany, to determine the impact on wartime sortie ratios when forced to operate in a chemical environment. After [deleted] hours, our wartime sortie capability had dropped [deleted] of our expected capacity. In other words, the Soviets can effectively discount [deleted] of our Air Force simply by forcing us to operate under the constraints of our defensive chemical gear. Our forces cannot present a similar threat to the Soviets. Our inability to deliver long range persistent agent chemical munitions allows the Soviet Air Force to operate with impunity in the chemical warfare arena.

The United States must acquire the Bigeye binary chemical weapon. This munition provides the Air Force with a credible, effective, long range persistent agent munition. With such a weapon we could impose the same degradation on Soviet forces that they can now impose on us. In such a situation, the Soviets would find no military advantage in initiation of chemical warfare and therefore would be deterred from using their chemical munitions.

A credible retaliatory capability is essential to the deterrence of the use of chemical weapons against American armed forces personnel. Defensive measures are also essential if we are to survive should deterrence fail.

Operating in defensive gear and shelters in the presence of chemicals reduces warfighting efficiency and gives the enemy an advantage. A retaliatory capability allows the United States to counter an enemy chemical attack by forcing his military into protective gear; thereby, degrading his capability and taking away the advantage offered by his first use.

NAVY

Admiral BARTH. If we want to prevent fighting in a dirty chemical atmosphere, we need a capability to subject any adversary to the same environment. Defensive systems/clothing can be developed but the encumbrance to the individuals reduces their warfighting effectiveness.

History has demonstrated that a credible chemical retaliatory capability is the best deterrence to the use of chemical munitions. Since World War I no country that has had the capability to retaliate in kind has been subjected to chemical attack. History and current events are replete with examples of chemical agents being employed against those unable to retaliate. [Deleted.]

The Navy's goal is to avoid the use of chemical munitions. We need the Bigeye weapon to give us the strong at-sea chemical weapon delivery capability that will deter use of chemical weapons by any potential adversary.

ARMY

General WATSON. Senator Warner, I will address the Army viewpoint.

Chemical weapons were used on the battlefield in World War I with awesome effect. They remain a powerful instrument of war today. Chemical weapons are militarily effective. Chemical attacks are capable of causing mass confusion—even terror—among troops and can achieve extremely high casualty rates in the target area if personnel lack protection, training, or can be surprised. Even the shortest tactical surprise—less than the time to don a mask—is sufficient to achieve a high casualty rate. Perhaps more important is the fact that chemicals can force well-trained and well-protected troops into a protective posture which can severely degrade unit performance, resulting in a high force multiplier effect in favor of the user of chemical weapons.

Defensive measures alone will not deter chemical warfare. With current equipment, our force would suffer a severe performance decrement in a chemical environment due to the restrictions imposed by protective clothing, while the Soviets could operate largely unencumbered. This 30 to 50 percent operational degradation is equivalent to complete military ineffectiveness of our ground forces. Even with improved defensive equipment, this performance decrement will remain significant. A balanced capability, both offensive and defensive, is essential to serve as an effective deterrent to chemical warfare. No nation with such a program has ever, since the invention of these weapons, been the victim of an initial chemical attack. Only when nations have been unable to threaten retaliation in kind have toxic chemical agents been used against them.

I would also emphasize that we cannot rely on conventional and nuclear capabilities to deter chemical warfare. Nuclear and conventional forces are deterrents to war, and, therefore, are potential deterrents to chemical warfare. However, our conventional forces are presently at a significant military disadvantage if chemical warfare is initiated because of force degradation and our limited ability to retaliate. Thus, the Soviets would be encouraged to use chemical weapons in a conflict to negate our conventional forces. Moreover, we cannot rely on our nuclear posture as a credible deterrent to chemical use since the Soviets have approached parity in the nuclear arena. It is essential that barriers to nuclear weapons use be kept as high as possible—not lowered—to counter threats which can and should be handled in other ways.

In view of these factors, it is clear that pending success in our treaty negotiation efforts, the nation's chemical stockpile must represent a credible deterrent capable of effectively responding to the enemy's first use. To be credible, our retaliatory stockpile must be capable of forcing an enemy to adopt the same restrictive protective measures as he would impose on us by chemical use. This requires that we be able to hit him up close, deep, and in-between with a combination of effective chemical weapons systems and agents. Our present chemical stockpile does not have these capabilities.

An effective deterrent to chemical warfare not only necessitates a visible and viable chemical employment capability, but also the national will and resolve to employ it if necessary. Such a policy alerts potential enemies that their initiation of chemical warfare could precipitate a swift retaliatory strike and, therefore, have nothing to gain from chemical use.

DISPARITY IN CHEMICAL WEAPONS TRAINING

Senator WARNER. General Watson, your predecessor, General Fulwyler, last year indicated that the Army was doing considerably more in the way of training its personnel for chemical warfare preparedness.

Can you give us an update on that effort and to what degree is the gap between the realism and extensiveness of U.S. and Soviet CW training being appreciably closed?

General WATSON. In 1975, the Army assigned a high priority to chemical warfare (CW) defense training; that initiative continues today. However, this area remains one in which the Soviets continue to excel.

The primary objectives of CW training are: to accustom soldiers in survival measures in order to react automatically and exactly to chemical attack; to accustom soldiers and units to the physiological and psychological stresses of CW; and, to train headquarters and staffs in management of the battlefield in both CW retaliatory and defensive aspects.

Our philosophy is integrated training, which means training the soldier to perform his military skill in full protective equipment over extended periods of time. However, unlike the Soviets, our forces do not train with live agents, even those in dilute concentrations, thus we are forced to simulate a CW environment.

Our objectives are being accomplished through the training base, operational forces, an R&D program, and construction of the Chemical Decontamination Training Facility.

Training Base: Formal instruction, beginning at basic training, continues to improve in quality. The recently reestablished Chemical School at Fort McClellan, Alabama is reviewing training literature and establishing training standards for individuals and small units, along with providing professional training for chemical officers and NCOs.

Operational Forces: The initiative begun in fiscal year 1980 to place chemical expertise at unit level, to include a chemical NCO in every company, continues. Fiscal year 1985 will complete the program of some 3,600 spaces. Upon completion, every commander will be able to better plan and conduct effective training. Command emphasis from the senior Army leadership continues to be forthcoming and serves as the greatest readiness payoff in the short term.

R&D Program: We continue to pursue our active R&D efforts to develop realistic simulant agents and delivery means which are moderately punitive and interact with detention means and decontamination equipment analogously to the live threat agents.

Chemical Decontamination Training Facility: The FY82 MCA Authorization and Appropriations provide for a facility for training personnel of all Services in the detention, identification, and decontamination of toxic chemical warfare agents. This facility, to be located at Fort McClellan, Alabama, will be able to support the training of 5,000 chemical specialists annually in an environmentally safe, totally enclosed classroom. Training is scheduled to begin in July 1985.

In summary, every reasonable effort is being taken to ensure that the field soldier is knowledgeable and understands the cause and effects of chemical weapons and what action to take when under chemical attack. The soldier is supplied with the finest protective equipment available. He is constantly being trained at the individual and unit level to reinforce actions to be taken in the event of a chemical attack, with the emphasis on accomplishment of all tasks while in a chemical defensive posture, that is wearing of the chemical protective ensemble. Yet much still needs to be done, for although we have confidence in our forces' ability to survive initial chemical attacks, sustained operations in a chemical environment are not yet achievable.

NEAR-TERM MEASURES TO IMPROVE NAVY CW DEFENSIVE POSTURE

Senator WARNER. Admiral Barth, recognizing that the costs associated with attempting to acquire a "citadel" button-up capability in older vessels may be prohibitive, is serious consideration being given to other near-term options for improved ship survivability, for example, automatic high-power, hose-down systems—especially for carrier flight decks?

How about improved filtration systems for engineering spaces?

Admiral BARTH. Near term improvements in ship survivability in a chemical environment are common to most ship classes, and not specific to aircraft carriers. They will consist of improved ability to detect chemical agents, improved decontamination capabilities, and in the longer term collective protection systems (CPS's).

The Chemical Warfare Directional Detector is scheduled for procurement this year, and will provide the capability to detect nerve agents at ranges in excess of [deleted.] An improved nozzle for existing ship's water washdown systems is being evaluated for procurement in FY–85, and improved decontaminants are being evaluated for shipboard use with procurement planned for FY–84.

A prototype CPS is being installed in USS BELLEAU WOOD (LHA 3) this year, and [deleted.]

Near term improvements are limited by current availability of equipment suitable for shipboard use and fiscal constraints. They are only the first step in the Navy's effort to attain a capability to operate in a chemical environment.

NAVY DISINTEREST IN CW

Senator WARNER. Admiral Barth, over the course of the past few years, as this Committee has reviewed the state of American chemical preparedness one fact stands out: The U.S. Navy, while acknowledging the rather extensive capability of the Soviet Union to engage in chemical attacks at sea, appears to accord extremely low priority to the redressal of deficiencies in the Navy's own posture with regard to chemical preparedness.

What evidence can you give the Committee that the Navy is, indeed, taking the risk of chemical war seriously and allocating the necessary management and financial resources to correcting acute shortcomings in its defensive and retaliatory posture?

Admiral BARTH. The Navy is pursuing an incremental program to upgrade our chemical defensive posture. The program includes both research and development, and procurement in the areas of individual protection, detectors and monitors, collective protection, and decontamination. The initial step in upgrading readiness has been taken with the procurement of "off-the-shelf" items of individual protective equipment such as replacement of gas masks, and increasing allowances for gas mask canisters. Gas masks are being procured for 105 percent of ship's complement with 2 additional canister sets per man for the more vulnerable amphibious units, and 1 additional set for other ships. Improved equipment such as a new protective garment and long range detectors is programmed for procurement as it becomes available from the manufacturers. For example, $1.9M is budgeted for procurement of chemical warfare detectors in fiscal year 1983.

Procurement will increase as additional detectors become available, with approximately $82M planned for this program in fiscal year 1984–89. The Chemical Warfare Directional Detector will enter the fleet this year. The Chemical Agent Point Detector has completed Technical Evaluation, and is scheduled for procurement in fiscal year 1984. The British made MK III CBR protective suit is scheduled to be purchased this year (40,000), with a U.S. manufacturer to be awarded a contract in November 1983. When available 2 protective suits per man will be provided for amphibious units, and 1 suit per man for other ships.

A total of $95.5M is planned for R&D expenditures in fiscal years 1984–89. This is in sharp contrast to the $30.3M expended in fiscal years 1980–83. It should be noted that this is R&D funding for Navy unique items, and does not reflect the R&D for items which are common to several services and for which the Navy is not lead service.

The Navy's offensive chemical warfare program is the BIGEYE bomb. This binary chemical weapon is a joint Navy-Air Force project with the Navy designated as lead service. BIGEYE is scheduled to complete operational evaluation in fiscal year 1985 with production commencing later that year. Once produced BIGEYE will modernize the chemical weapon inventory available to the Navy, and will provide the deep strike persistent chemical weapon capability required to deter enemy first use of chemical weapons.

With respect to management, CNO has increased the priority of chemical warfare programs within the Navy. The Director, Naval Warfare has been assigned responsibility for developing chemical warfare offensive and defensive requirements, and setting priorities to meet those requirements. A flag officer Theater Nuclear/Chemical Warfare Steering Group has been established to review and monitor chemical warfare programs.

In summary, the Navy has taken a hard look at our past deficiencies and is proceeding to correct them as quickly as possible.

QUESTIONS SUBMITTED BY SENATOR STROM THURMOND

Senator THURMOND. Some people claim that our threat of first use of nuclear weapons in a conventional war can be extended to cover retaliation for use of chemical weapons. How do you respond to this idea?

Dr. GOLD. If there has been an overriding theme among Americans on all sides of defense issues during the last 20 years, it has been the desire to keep the nuclear threshold as high as possible—to prevent nuclear war. Undesirable as it might be, relying on a nuclear response might have been credible in the days when we had clear nuclear superiority. However, now that the Soviets have attained at least parity in the nuclear arena, it is not credible. We and our allies have been investing billions of dollars in conventional forces to have the capability to turn back a Soviet attack without automatic or early recourse to nuclear weapons. Yet the asymmetry in chemical capabilities could allow the Soviets to negate our conventional improvements. If we do not restore a credible retaliatory capability, nuclear weapons are all we have left to deny the Soviets a cheap victory from chemical use.

Senator THURMOND. Has any more information been developed on Soviet use of chemical weapons in Afghanistan?

Dr. GOLD. Secretary Shultz submitted a report to the UN and Congress in November of 1982. This report was an update to a report submitted by Secretary Haig in March 1982. The later report contained information on a Soviet gas mask recovered from Afghanistan which was contaminated with the same toxin earlier identified as being used in Southeast Asia.

Senator THURMOND. If the United States begins production of chemical weapons in 1984, how long will it take to acquire a credible deterrent?

Dr. GOLD. With the program we propose, the first binary artillery projectile will not be delivered until 1985, and the first BIGEYE bomb will be delivered in 1987. We expect to receive the last of our modest deterrent stockpile of 155 mm and BIGEYE binary munitions in 1992.

Senator WARNER. Unless there is further testimony to be presented, this hearing will be adjourned. We hope to have a second hearing on this subject.

[Whereupon, at 12:30 p.m., the subcommittee adjourned, subject to the call of the Chair.

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1984

FRIDAY, APRIL 15, 1983

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC AND
THEATER NUCLEAR FORCES,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

AIR-BREATHING DETERRENT

The subcommittee met in open session pursuant to notice, at 9:07 a.m., in room SR-222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Members present: Senators Warner and Stennis.

Staff present: James F. McGovern, staff director and chief counsel; Frank J. Gaffney, Jr., George K. Johnson, Jr., Patrick L. Renehan, professional staff members; Karen A. Love, staff assistant.

Also present: John Campbell, assistant to Senator Warner; Hank Steenstra, assistant to Senator Quayle; Frank Sullivan, assistant to Senator Stennis; Arnold Punaro, assistant to Senator Nunn; Greg Pallas, assistant to Senator Exon; and Peter Lennon, assistant to Senator Levin.

OPENING STATEMENT BY SENATOR JOHN W. WARNER, CHAIRMAN

Senator WARNER. The subcommittee reconvenes at this time in open session to continue a highly important discussion relating to the air-breathing component of America's strategic deterrent which we initiated on Monday of this week in executive session.

We are pleased to have as witnesses officials—in and out of uniform—who share important responsibilities for the operational capabilities of today's bomber forces as well as for the viability of tomorrow's air-breathing systems.

They are Dr. Thomas Cooper, Assistant Secretary of the Air Force for Research, Development, and Logistics; Maj. Gen. Jasper Welch, Assistant Deputy Chief of Staff for Research, Development, and Acquisition; Maj. Gen. William Thurman, Deputy for the B-1B; and Brig. Gen. John Shaud, Deputy Director of Plans, Headquarters, Air Force.

Doctor, you may lead off this morning. We anticipate other Senators will be joining us, but I think it is well that we get underway.

STATEMENT OF HON. THOMAS E. COOPER, ASSISTANT SECRETARY OF THE AIR FORCE (RESEARCH, DEVELOPMENT, AND LOGISTICS)

Dr. COOPER. Thank you, Mr. Chairman.

I have a prepared statement, but in the interest of time, I will submit it for the record and just r ake a few brief comments.

As you mentioned, we ar here this morning to discuss the air-breathing leg of our strategic triad of forces. As you will recall, General Skantze and I appeared on Monday in closed session with Dr. DeLauer to talk about the threat that faces the air-breathing leg and our proposed plans to counter that threat.

This morning, here in open session, what we will do is describe to you the various elements that make up the air-breathing leg of the triad.

I would like to remind the committee that what we are doing with the air-breathing leg is consistent with the President's five-point strategic modernization program that he announced in October 1981. As you will recall, those five points proposed to improve our strategic command, control, and communications system, make improvements to our ballistic missile force, proposed sea-based improvement to the land-based ballistic missile force, also set out a program to modernize the air-breathing leg and, in addition, proposed some improvement to our CONUS defense.

Just to focus for a moment on the air-breathing leg in simplistic terms, what our program proposes to do is to modify and upgrade the B–52 G and H force in the near term and that includes equipping those assets with the air launch cruise missile. In the near term, the first generation air launch cruise missile to be followed in the latter part of the decade with the advanced cruise missile.

Senator WARNER. By the way, on that point, I understand that the Department may well issue a contract in the near future.

Dr. COOPER. I hope that is imminent, Mr. Chairman.

Senator WARNER. I don't know anything about it, but please inform counsel for this committee at the time when that decision is made.

Dr. COOPER. We will do that.

Senator WARNER. Thank you.

B–1B

Dr. COOPER. In addition, the centerpiece of the air-breathing leg is the B–1B bomber and we are progressing smoothly with that program and the plan is to develop and procure and deploy 100 of the B–1B's and to have that deployment complete in 1988.

The B–1B will be followed by the advanced technology bomber coming into the force in the early nineties. We also plan to re-engine our KC–135 tanker fleet.

Senator WARNER. I would be a little more specific about the advanced technology bomber in terms of the date when it will enter the bomber force.

Can you give us a little more refinement of those dates?

Dr. COOPER. I can do that, but unfortunately we have to close.

Senator WARNER. There is nothing open on that, other than early nineties?

Dr. COOPER. Early nineties is all we can say on the public record.

Senator WARNER. The reason I press that point is that there is a good deal of understandable concern about the confluence of the number of systems in our strategic force on or about the late eighties or early nineties.

We have MX, Midgetman, Trident II, Stealth bomber. These not only have strategic implications, but cost implications.

My colleagues might inquire quite properly about the need for so many systems coming together in such a short period of time. For the record, then, in open testimony, the early nineties is what the Department wishes to stand on with respect to the Stealth bomber?

Dr. COOPER. For the IOC of the Stealth bomber, early nineties; yes, sir.

Mr. Chairman, I would like to turn the session over, with your concurrence, to Major General Welch, who will provide a more detailed briefing on the various programs.

General Welch then will be followed by General Thurman who is our program manager for the B–1B bomber and who will give a special presentation on the B–1B.

[The prepared statement of Dr. Cooper follows:]

PREPARED STATEMENT OF HON. THOMAS E. COOPER, ASSISTANT SECRETARY OF THE AIR FORCE, RESEARCH, DEVELOPMENT AND LOGISTICS

Mr. Chairman and members of the committee, I welcome this opportunity to report to you on the Air Force programs in support of the Air Breathing Leg of the Triad and the Fiscal Year 1984 budget requests for these programs.

Our strategy for meeting the rapidly growing Soviet threat, as you have recently heard from the Secretary of Defense, is based on three basic principles that are defensive in nature. First, we will not initiate a conflict; that means, of necessity, that we concede to our potential adversaries the advantage of surprise and the opportunity to pick the time and place of any conflict. Our resources, therefore, have to be maintained in a very high state of readiness, forward positions maintained where feasible, and additionally our command, control, communications and intelligence capabilities must be flexible, enduring and reliable.

Second, our strategy is to deter war. For this, we need a strong, survivable nuclear and conventional force posture that is designed to convince any potential adversary that the cost of aggression would be far too high to justify any attack on this country.

Third, should deterrence fail, our strategy is to restore peace on favorable terms at the lowest possible level of conflict and at the earliest opportunity. To carry out these strategies, we need mobile, flexible and sustaining forces with capabilities that can counter the forces that would be deployed against us.

Strategic force modernization is the highest priority effort contained in this budget request. The fundamental objective of our strategic nuclear forces is to deter nuclear attack. In light of substantial Soviet commitment to strategic force buildup, the ability of our strategic forces to maintain their deterrence value must be assured by a series of steps toward force modernization.

In October 1981, President Reagan announced a comprehensive plan for strategic force modernization. The intent of this program is to strengthen deterrence of nuclear war by denying the Soviets any realistic prospects of gaining an advantage through the use of nuclear weapons.

The most urgent task is to modernize the strategic forces because we cannot risk the failure of nuclear deterrence. Accordingly, we are strengthening our nuclear forces to maintain a credible deterrent and a stable nuclear balance. We need an effective, survivable Triad of strategic forces—bombers, intercontinental ballistic missiles, and submarine launched missiles. The Triad complicates Soviet planning for an attack on our strategic nuclear forces, prevents them from concentrating efforts to defeat a single element, provides maximum flexibility in the use of our forces, and hedges against catastrophic failure of any one leg.

Each element of the Triad has distinct advantages. Land-based missiles have the best capability against hardened Soviet command centers and missile silos. They have great accuracy, prompt response, high alert rates, and low operating costs. Bombers are the most flexible element. They can be launched, redirected, recalled, and used again. They can be used in a variety of ways, including attacking imprecisely located targets, conventional operations, and sea lane control. Missile carrying submarines contribute to survivability and endurance. Taken as a whole, the Triad ensures that our forces can survive a Soviet first strike and retaliate with devastating force—the very basis of deterrence.

Today I would like to address a key element of that Triad, the Air Breathing Leg, consisting of bombers and the associated Air Launched Cruise Missile (ALCM).

MANNED BOMBERS

The bomber is the most flexible element of the Triad. It can be launched and controlled prior to a decision to employ nuclear weapons. It can be redirected, accomplish attack assessment, and be reconstituted for follow-on missions. Bombers can be launched to ensure their survivability or to signal national resolve during time of crisis.

Bombers carry a large number of weapons, and each bomber can cover widely separated targets. It provides the only capability to engage imprecisely located or mobile targets by using the crew and aircraft sensors to determine target location. As reusable weapon systems, long range combat aircraft can deliver large nuclear or conventional payloads accurately throughout the spectrum of conflict. In maritime roles, bombers can provide long range sea surveillance, ship attack, and mine laying.

The nature of the conflict throughout today's world vividly demonstrates that conventional bombers are still a necessity. We can use our B–52 force as a conventional deterrent, and this was aptly demonstrated by their performance in exercise Bright Star 82. B–52s flew approximately 8,000 miles to Egypt, dropped their bombs within 30 seconds of designated times, and returned to base nonstop.

Our bomber modernization program is designed to counter Soviet defense improvements, overcome limitations imposed by the advanced age o fthe B–52, and control increasing maintenance costs.

Our program will maintain the usefulness of the B–52 while laying the groundwork for increased bomber capability in the future. The plan calls for production of 100 B–1Bs to increase near-term capability; conversions of B–52Gs and Hs to cruise missile carriers and conventional roles to maintain their usefulness over the long term; retirement of B–52Ds; and development of an Advanced Technology Bomber (ATB) to meet the challenge of the future.

B–1B.—Despite Soviet improvements, we are confident that the B–1B will be able to penetrate the projected Soviet air defense network well into the 1990s. This ability is gained through a combination of low altitude penetration tactics, speed, improved electronic countermeasures, and a significantly reduced radar cross-section. These technological improvements in the B–1B will ensure continued effectiveness for years to come.

The B–1B will be able to perform the missions of conventional bomber and cruise missile carrier as well as nuclear weapons delivery. Therefore, as the B–52 nears the end of its service life and the ATB enters the force, we will be able to use the B–1B in multiple roles, thereby maintaining our conventional and cruise missile capability well into the next century.

We remain committed to producing 100 B–1Bs and initial spare parts within the projected cost of $20.5 billion in constant 1981 dollars. Our current approach is predicated upon use of multiyear contracting to achieve the most efficient buy possible. The FY 84 request of $6.929 billion is for research, development, test, and evaluation; procurement of ten aircraft; and initial spares. We still project an initial operational capability in 1986, and B–1B contractors are on or ahead of schedule and within cost.

B–52.—The B–52Hs and majority of Gs will be converted to cruise missile carriers. B–52Ds will be retired and the remainder of the Gs will pick up the D's conventional role. As their penetration capability declines this decade, the B–52 strategic role will transition to a shoot-and-penetrate mission and finally to pure stand-off delivery.

We are requesting $607 million in FY 84 to fund the Offensive Avionics System (OAS), Cruise Missile Integration (CMI) with internal and external carriage, and related modifications necessary for the B–52 to effectively perform its intended roles.

ATB.—We continue to pursue development of an ATB to ensure we maintain the advantages of manned bomber weapons delivery into the twenty-first century. We are proceeding with development of the ATB at the fastest reasonable pace to deploy a bomber that is effective across a range of combat applications and that is durable and maintainable as well. The ATB requires an orderly and logical development pattern to capitalize on new "stealth" technology and to avoid costly redesigns.

ALCM (AGM–86B).—The cruise missile is an effective weapon for attacking preplanned, fixed strategic targets. A survivable, accurate, long range weapon, the cruise missile will increase bomber targeting and routing flexibility; reduce exposure of our bombers to present and projected air defense threats; and confront the enemy with a large number of attackers. The initial operational capability of B–52Gs equipped with 12 external ALCMs each was achieved in December of 1982.

We plan to continue our follow-on testing of ALCM over operational realistic terrain. We will ensure that the missile and missile improvements meet our needs. We anticipate selection of a contractor for the second generation ALCM in March 1983. Our objective remains to improve the survivability, range and accuracy of the ALCM in response to the projected Soviet threat.

Aerial Tankers.—Although not directly a part of the Air Breathing Leg of the Triad, aerial refueling support is essential to virtually all manned bomber missions—strategic and conventional—and therefore deserves mention in this discussion. At present, we do not have sufficient tanker capability to support both strategic missions and tactical air operations simultaneously. While this could sharply limit our military options now, the problem could become even more severe in the future as we increase our inventory of aerially refuelable aircraft. To reduce these shortfalls, we are expanding our aerial tanker capability by reengining existing KC–135As and purchasing additional KC–10s.

Reengining KC–135s with current-technology CFM56 engines (the KC–135R program) will significantly increase their fuel dispensing capability, while reducing their operating and maintenance costs. The KC–135R program also includes moderinzation of many aircraft subsystems, which will ensure the fleet's continued effectiveness well past the year 2000.

That completes my formal presentation, Mr. Chairman.

Dr. COOPER. I would just like to mention for the record that General Skantze wanted me to express his regrets that he could not be here today.

He also has a prepared statement. I would like to submit that for the record.

Senator WARNER. General Skantze's statement will be admitted.

[The prepared statement of General Skantze follows:]

PREPARED STATEMENT OF LT. GEN. LAWRENCE A. SKANTZE, DCS/RESEARCH, DEVELOPMENT AND ACQUISITION HQ, U.S. AIR FORCE

Mr. Chairman and members of the committee, I am pleased to appear today to discuss the Air Force Fiscal Year 1984 Research, Development and Procurement programs which support the Air Breathing Leg of the Triad.

Historically, the unique military characteristics of the manned bomber have provided a vital dimension of flexibility to our strategic and tactical forces. As reusable strategic weapon systems, long-range combat aircraft can accurately deliver large nuclear or conventional payloads throughout the entire spectrum of conflict.

Bombers are the only element of our strategic Triad that can be launched prior to a decision to employ these weapons. During a crisis, manned bombers can be launched to ensure their survivability or to signal national resolve. As the situation requires, bomber crews can then be redirected or recalled with confidence. Moreover, bombers provide the capability to conduct damage assessment strikes against fixed targets and to engage unanticipated or imprecisely located targets. In addition, through the use of human judgment and on-board sensors, crews can determine target location and status at the time of strike.

The manned bomber also provides a major element in our ability to project a nonnuclear force—either to complement our tactical forces or in response to

unforeseen contingencies worldwide. Additionally, bombers are able to provide maritime support to U.S. naval forces through long-range sea surveillance, ship attack, and mine laying.

In light of the rapid advances in the Soviet military arsenal and Soviet-backed adventurism around the world, the need to modernize our strategic bomber force is clear and compelling. The B–52s have been the mainstay of our manned bomber force for the past 25 years, but their ability to continue to serve effectively in the long term is diminishing. First of all, they are becoming more difficult and expensive to maintain. In addition, because B–52s are not fully hardened against the effects of nuclear blasts and are relatively slow in flying out from their bases, they are more vulnerable to attacks from SLBMs launched from Soviet submarines patrolling off our coasts. Moreover, because of their large radar reflectivity and relatively slow speed at low altitudes, the B–52's capability to penetrate Soviet air defenses will decline substantially during the latter part of this decade.

The limitations inherent in the B—52 make it imperative that we start fielding a follow-on bomber now. We have begun a time-phased bomber modernization program designed to effectively use the existing capabilities of the B–52 while laying the groundwork for our future bomber force. The plan calls for the major portion of the B–52G and B–52H force to be modified to carry cruise missiles. At the same time, we will produce 100 B–1Bs which will have an Initial Operational capability (IOC) in 1986. The final segment of the plan is to develop and produce an Advanced Technology Bomber (ATB) with an estimated IOC in the early 1990s.

Acquiring the B–1B while continuing to pursue the ATB is the most prudent approach for revitalizing our bomber forces. This approach enables us to field the necessary additional forces required during a period when the United States must depend heavily on bombers, while we take the proper steps to strengthen our land-based missiles. It will also provide time for an orderly and logical development pace of the ATB to capitalize on this important technology and avoid major risks and costly redesigns. In addition, a combined force of B–1Bs, ATBs, and cruise missiles will place maximum stress on Soviet air defenses and provide the United States with significant deterrent capability.

The B–1B is about 80 percent common with the original B–1 in terms of basic airframe and engine design. It will incorporate state-of-the-art improvements that will make it highly survivable against existing and projected threats. For example, the B–1B will embody a combination of techniques to reduce its radar cross section to a level one-tenth that of the original B–1 and one-hundredth that of the B–52. It will also include the latest developments in electronic countermeasures technology and offensive avionics systems. These developments, in conjunction with its speed and low level capabilities, will provide high confidence that the B–1B will be able to penetrate Soviet air defenses well into the 1990s and perform as an effective strategic offensive weapon system.

Because the B–1B will be capable of performing the missions of a conventional bomber, a cruise missile launch platform and a nuclear weapons delivery system in strategic and tactical roles, it is an essential element of the President's Strategic Modernization Program.

The President has certified to the Congress that we can field the B–1B on time and within the projected cost to $20.5 billion (expressed in Fiscal Year 1981 constant dollars, or $28.3 billion, expressed in then year dollars), if the Congress appropriates the money in the amount and on the schedule advanced by the Administration. This confidence stems from the fact that the major part of the engineering is complete, the design is mature and tested, and the B–1 has already undergone almost 2,000 hours of highly successful flight testing. The current program incorporates no new technology development. Our primary focus is for initial production, such as forgings, tooling, and materials, have been retained from the original B–1 program and are available. Finally, we have in place a highly skilled and experienced team of Air Force and contractor personnel to manage the program.

The Fiscal Year 1984 B–1B RDT&E program continues necessary development and test activities, including work deferred from the original B–1A program, cost/producibility redesigns, development of multirole capabilities, integration of modern off-the-shelf avionics and flight tests. We intend to seek multiyear funding approval for the B–1B beginning in Fiscal Year 1984, with advanced procurement in Fiscal Year 1983, to take advantage of major savings opportu-

nities in the purchase of economic lots of raw materials, parts, subassemblies, etc.

As for the ATB, we have selected the prime contractor as well as other key members of the development team. While most details of this program are classified, the essential point is that the ATB is being developed using low observable techniques to negate the effectiveness of present and projected air defenses. The technologies involved are exciting and promising, but because of the major advances required in several areas and the consequent uncertainties involved, there would be a high degree of program risk in concentrating solely on the ATB. For these reasons and others, a significant acceleration of this important program is not prudent at this time. However, we are confident that our orderly development program will enable us to resolve these uncertainties and will result in an ATB that represents a technological advance of extraordinary military significance. When deployed in the 1990s, it will augment the B–1Bs capabilities and contribute dramatically to the strength and deterrent value of our strategic forces well into the next century.

Until the B–1B is available, the B–52 will remain the mainstay of the bomber leg. As these aircraft transition to the cruise missile carrier role, we expect them to remain effective well into the 1990s. These continuing capabilities will require modifications and updates to counter the expected threat, maintain aircraft effectiveness and reliability, and keep the aircraft supportable. RDT&E activities include avionics updates to B–52Gs and B–52Hs for Air Launched Cruise Missile (ALCM) compatibility; updates to selected critical subsystems, including the radar to correct reliability and supportability problems; and development of essential electronic countermeasures and nuclear hardness upgrades.

Our B–52 procurement efforts have been largely devoted to obtaining offensive avionics system modification kits for the B–52G and B–52H, as well as modification kits for a cruise missile external carriage capability. In Fiscal Year 1984, we will continue procurement of cruise missile carriage modification kits for the B–52H, while developing the Common Strategic Rotary Launcher (CSRL) for internal carriage.

We are continuing procurement of the ALCM–B, the only major near-term initiative we have to counter the growing expansion of Soviet military capabilities. The ALCM–B enhances our bombers' capabilities by providing greater weapons accuracy, increased flexibility for bomber routing and targeting, reduced bomber exposure to defenses, and increased defense saturation. Our RDT&E activities include development of depot support equipment, engine performance and reliability improvements, and other upgrades to enhance the ALCM–B's effectiveness. Additionally, we are currently evaluating competing designs for an Advanced Cruise Missile (ACM). These designs offer substantial improvements in long term effectiveness. The ultimate force mix of ALCM–B and ACM will depend on the outcome of the ACM source selection and its overall cost. The Fiscal Year 1984 Procurement funds are for ALCM–B support equipment.

The near-term deployment concept is to carry a mix of ALCMs, Short-Range Attack Missiles (SRAMs), and gravity bombs on those B–52s modified for cruise missile carriage. This will prevent the Soviets from optimizing their defense against the bomber or the cruise missile, and will provide maximum deliverable megatonnage and weapons during the transition period of the B–52 to a standoff, cruise missile carrier role.

In reviewing the internal weapons carriage on current and planned bomber forces, we recognized an opportunity to consolidate several rotary launcher development efforts into one CSRL. In addition to carrying strategic gravity nuclear weapons and cruise missiles, the CSRL will be designed for and be compatible with future conventional weapons such as the Medium Range Air-to-Surface Missile (MRASM) and the Conventional Standoff Weapon (CSW). The CSRL will avoid launcher proliferation and reap the cost, operational, and support benefits associated with a common design.

In order to defend the B–52, FB–111, ALCM, and tactical aircraft against the increasingly lethal and sophisticated Soviet air defenses, we have some very important efforts centering around the Protective Systems program. This program develops and tests improved electronic, infrared and electro-optical countermeasures.

Tanker aircraft are a vital part of our bomber and conventional forces. Our major effort is to modernize the KC–135A by replacing the current engines with CFM56 modern technology engines and upgrading 34 subsystems. We are continuing the wing reskin structural modifications to extend the C–135 service life in line with force structure planning.

Reengining with the CFM56 is the most cost-effective means of alleviating a serious and growing tanker shortfall. A reengined KC–135, designated the KC–135R, is on the average as capable as one and one-half KC–135As and will have a useful life well into the next century. Aside from helping to reduce increasing tanker shortfalls, the KC–135R will also correct specific KC–135A operational and environmental deficiencies. With its performance improvements, the KC–135R will off-load more fuel and provide increased operational flexibility by eliminating our current dependence on extremely long runways.

In addition, the new engines will offset the high and growing costs of operating and maintaining the present aging engines. Because of fuel efficiency alone, we estimate that a fleet of KC–135Rs would save approximately 110 million gallons of fuel per year—a five year savings of over $715 million. Finally, the CFM56 will meet Federal Aviation Administration noise and pollution standards which the current J57 engines do not meet.

In Fiscal Year 1984, we plan to buy a total of 31 kits for KC–135R aircraft; through Fiscal Year 1988, we plan to buy approximately 334 kits. Joining our KC–135R modernization effort, the French government will reengine its eleven C–135F aircraft, as part of the production program.

Senator WARNER. You might express to the general, I am certain the Deputy is equally competent to provide us with the facts.

Dr. COOPER. We have Major General Welch who is the Assistant Deputy Chief of Staff for Research, Development and Acquisition; General Skantze's right-hand man.

We also have Gen. Bill Thurman, Deputy for the B–1B program and Brig. Gen. John Shaud, Deputy Director for Plans, Headquarters, Air Force.

With that, Mr. Chairman, I would like to turn it over to General Welch.

Senator WARNER. Good morning, General.

STATEMENT OF MAJ. GEN. JASPER WELCH, ASSISTANT DEPUTY CHIEF OF STAFF (RESEARCH, DEVELOPMENT AND ACQUISITION)

General WELCH. Good morning, Mr. Chairman.

With your permission, I will stand at the screen and speak up so that everyone can hear.

RESEARCH, DEVELOPMENT AND ACQUISITION

I appreciate the opportunity to be here. I have had some time with these programs and it is quite pleasing to me to see how well they are coming along. I would like to share that with you. If I sound a little over enthusiastic, it is because of the hurdles we have overcome, not being unmindful of those ahead.

Senator WARNER. I think from what I know, your enthusiasm is equally justified not only for yourself, but other members of the Department.

General WELCH. Thank you, sir.

The next slide is an overview of the main programs which are important, mostly in their size and budget implications, but also in their capabilities.

Listed here you will see the B–52, the B–1B, the advanced technology bomber, air launch cruise missile, the advanced cruise missile, and the KC–135 to be reengined. We have listed those in research and development dollars and procurement dollars here.

I will be going through these programs one by one in subsequent slides.

You will see here in these pictures the B–1B over the rugged mountains, here is the B–52 with cruise missiles attached to the wings and the KC–135 refueling, in this case a fighter plane.

You will notice by and large the B–1B has larger research and development and larger procurement dollars and we will get into the reasons for that in just a moment.

Senator WARNER. One more quick glance at that slide.

Do you have copies of these charts with you today?

General WELCH. We will have to get them for you.

Senator WARNER. I would like to study them.

General WELCH. Here on the slide is the B–52, $607 million for procurement. That is primarily for the modifications. There are breakouts in subsequent slides.

The B–1B has $750 million for research and development and $5,627 million in procurement. The ATB figures cannot be disclosed at this classification level. For the air launch cruise missile, there is $29 million in RDT&E and $104 million in fiscal year 1984 for procurement.

You may remember that there are no missiles to be authorized or requested for authorization in the ALCM–B. This is for procurement of support equipment, spares, initial spares, and other.

Senator WARNER. Only in ALCM–B. The advanced ALCM–B is not in that line?

General WELCH. That is right. The advanced ALCM–B has its own line.

Senator WARNER. I have it now.

General WELCH. Then the $996 million for procurement for the KC–135 squadron is primarily the reengining.

Senator WARNER. That sum of money for the KC–135 will fund how many aircraft?

General WELCH. Of this, the part that is associated with the reengining is not that whole amount. It is the lesser amount. We will get that in the next slide. There will be 31 requested in the——

Senator WARNER. That is what percentage of your total fleet?

General WELCH. That is 5 percent of 600, roughly.

Senator WARNER. So we have a big job ahead of us?

General WELCH. We have a big job ahead of us. At that rate, we will be doing 65 to 72, the 72 is the level rate we will achieve in about 3 years.

Senator WARNER. There are substantial fuel savings to offset that?

General WELCH. There are substantial fuel savings. I believe that if you do it as an economic matter, you will find that large amounts are offset, but I think our principal objective is the greater capability that we will achieve.

Senator WARNER. Thank you.

General SHAUD. A reengining is worth about 1½ KC–135's.

General WELCH. Another rule of thumb which is useful and one which is predominant on the cost efficiency base is that we could have asked for new airplanes in lieu of this reengining. That would have cost for the same amount of capability three times as much.

So, we are getting the added capability that we need at one-third the price of buying a new plane by going to this modification. It is a very slight modification which will keep the airplane in service for another 35 or 40 years.

Senator WARNER. What about the Guard elements?

General WELCH. The Guard elements will, in due course, get the KC–135 reengining with this particular type engine. Congress provided funds last year for putting an interim engine on some of the Guard aircraft to speed up the progress.

Dr. COOPER. Mr. Chairman, we see three primary benefits. Of course, General Welch was mentioning thrust improvement if we go with the CFM–56. It will have a greatly increased fuel efficiency and also as a spinoff be 96 percent quieter from the environmental concern point of view.

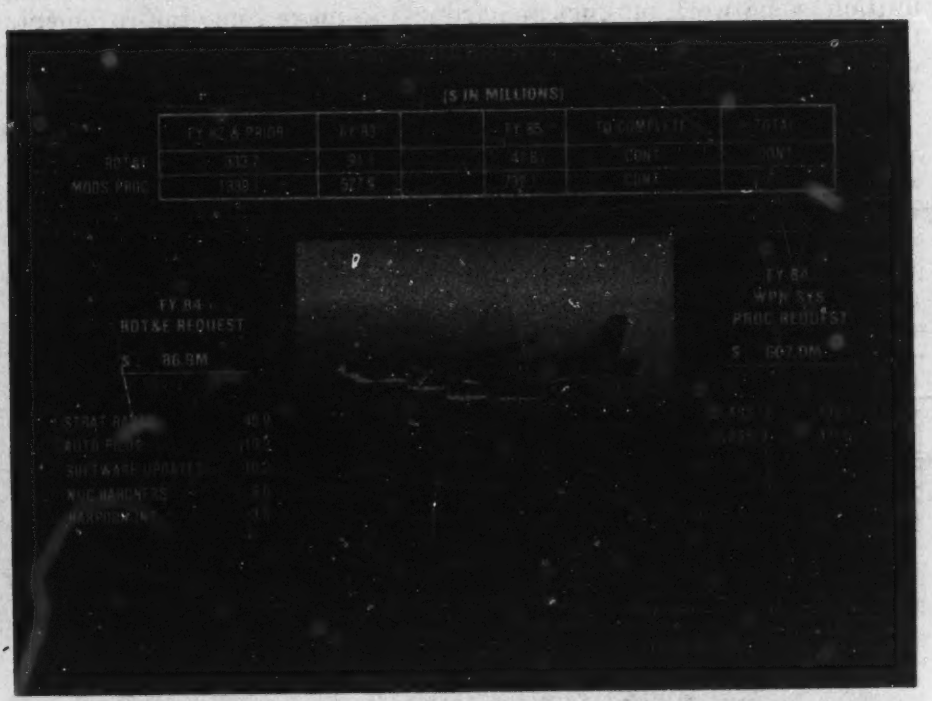
B–52 MODIFICATION

Maintains B–52 as an effective strategic deterrent.
Integrates cruise missile capability.
Reliability updates increase effectiveness while decreasing support costs.

General WELCH. The B–52 modification program is a substantial program. I think it is important to realize that we will be having B–52's in the force for a decade or more. It is the carrier which is currently used for the cruise missile, a very important part of our cruise

deterrent, and most of the modification program in fact is directly or closely associated with integrating cruise missiles on the B–52's.

Again, these modifications, to some very substantial extent, repay themselves in downstream support savings.



This is a format that we will use for each of the programs. I might spend just a moment on the format.

This is a pictorial depiction of the weapon ssytem here. Across the top we have the research and development line and below that the procurement line—in this case, modifications primarily. We will show fiscal year 1982 and prior years in the first column, fiscal year 1983 in this next column.

These numbers then are $91 million for research and development, and $528 million for modification and procurement in fiscal year 1983, the one we are now in.

The request for 1984 is highlighted in yellow. That is $86.9 million for RDT&E and $607 million in procurement.

Then the next column will show the request for authorization for fiscal year 1985: $42 million for RDT&E; $732 million in procurement.

This continues on for some number of years as the B–52 G's and the H's are converted to cruise missile carriers.

Then to look at the 1984 request specifically, on the procurement side, on the righthand side, it is $607 million. It is broken down into Class IV modifications—those for reliability, maintainability purposes—$135 million, and Class V modifications which are performance improvements—primarily the improvement to the defensive avionics and to the cruise missile carriage at $471.5 million.

The research and development request is $86.9 million and that is in support of both the Class IV and Class V modification programs. These are the largest RDT&E projects groups here to improve primarily strategic radar reliability, the autopilot, the softwave updates at $10.2 million, some work on nuclear hardness to make some improvements there and the integration of the Harpoon missile onto the B–52—which is an adaptation of an already proven Navy development, and in procurement by the Navy.

We have had, I might say, out of three tries, three successful firings of the Harpoon from the B–52 against a surface ship target. Those were very interesting operational tests in that the airborne warning and control system—the AWACS—provided the targeting of the target ship and location and direction of the B–52 and brought the B–52 into proximity of this target ship ranging from 30 to 60 miles away and the Harpoon was released from the wing of the B–52, flew to the target and all test objectives were met. The details of the test we can provide to you, if you are interested.

I think the next slide breaks out the content of the modification procurement program. It is a very important program to us. The offensive avionics is the largest group. That is again improving the capability of the avionics which was built into the airplane roughly 25 years ago.

The internal cruise missile carriage, $145 million. The strategic radar upgrade at $65.5 million and then the external cruise missile, again $65 million.

We also are putting in the ALQ–172, our electronic countermeasures set, into the B–52H model starting at $54.3 million. This particular electronic countermeasure is bringing modern digital equipment into the B–52.

The ECM is key to specific understandings of the mission of the B–52, as currently envisioned, and to specific threat requirements, as that threat increases on the Soviet side.

The environmental system is being——

Senator WARNER. Let me interrupt.

In other words, that is still contemplating a full-scale penetration mission?

General WELCH. This particular electronic countermeasure is key to the mission envisioned for the B–52 in the future. In that case, you will see that that is heavily oriented toward cruise missile carriage.

Senator WARNER. Standoff mission? I am trying to differentiate between the standoff mission and penetration.

General WELCH. I think that is an important distinction. For those aircraft that have cruise missiles external, and I don't want to be ironclad about this because the commander at the time will make those decisions, but the general notion is that those cruise missiles will be launched from outside of the peripheral defenses.

Then they are cleaned up and either launch cruise missiles carried internally, if that is the case, or if they have internal weapons to penetrate into the Soviet Union.

One of the common misconceptions is that you come up to the border of the country and suddenly there is a big wall of defenses there. It is not that way at all. There are some parts of the Soviet Union that are more heavily defended, some that are less heavily defended.

As time goes on, what we find is that our more capable aircraft are then reserved for the more demanding penetration mission and the less capable aircraft are able to fortunately take care of the less demanding cases.

So, over a period of time, as years go by, we will find that the most capable aircraft will go into the most demanding missions. So, right now we would have FB–111's which don't have a great deal of payload and perhaps don't have quite all the range of the B–52, but fly low and fast and they would go in and get penetration in areas that are not too deep.

The B–52H's go farther. The G and older models will take on the less demanding missions. As we get the B–1B's, we would expect to see the B–1B's take on more demanding tasks, the B–52's falling back and taking on the less demanding tasks and when the advanced technology bomber comes in, there will be a sequence then.

Senator WARNER. We are caught in our own rhetoric around here. I will have to answer this on the floor—we often say that the B–52's are older than the pilots flying them—the justification for the B–1B and the Stealth.

This modification program will accommodate how many aircraft?

General WELCH. This program taken altogether will, in fact, modify all of the H's and about 90 of the G models.

Senator WARNER. About 180 aircraft?

General WELCH. Yes, plus lesser modification to the remaining 60 G models. Another 61 will be noncruise missile-carrying G models.

Senator WARNER. With the same package?

General WELCH. Except for the cruise missile carriage.

Senator WARNER. That block of aircraft now having a useful life for what additional period of time?

General WELCH. In rough terms for a decade.

Senator WARNER. You would not be investing this money if the other components of the aircraft were in such condition that they could go into that decade.

General WELCH. That is correct.

Senator WARNER. We will not be confronted with another major modification package of the size comparable to this for this block?

General WELCH. Not for the decade. You may remember when we went through the work preparatory to the President's strategic modernization program, considering what we should do in regard to the B–1B's, the Stealth, and B–52's, we looked at the case of what would you have to do to keep the B–52's in the inventory for two decades, to the turn of the century.

We found that in order to do that, really quite substantial modifications in addition to these shown here were necessary.

For example, new engine, structural modification. One would have to take all the wires out and put all new wires back in. That program taken together was more expensive than to modernize with more capable aircraft.

So, if you have them much beyond the decade, I think you would incur substantial additional cost.

Senator WARNER. What is likely to be our figure next year for this program?

General WELCH. It will be of comparable size.

Senator WARNER. A flat line around $600 million here?

General WELCH. Perhaps a bit larger. We have 732.1 in 1985 as our estimate at the present time. That will continue for the next several years at about that level.

Senator WARNER. Three-quarters of a billion dollars?

General WELCH. Yes, sir.

Senator WARNER. Would you touch on the environmental? I interrupted you.

General WELCH. This environmental control system is a fancy name, if you will forgive me, for the cooling air that keeps the electronics cool and comfortable and reliable and working.

Those environmental control systems are as fancy as the electronics. They are absolutely essential to keep the program working.

You will notice we are requesting $15.4 million in procurement for Harpoon in fiscal year 1984. Then, there are a number of other modifications, primarily associated with, in this case, correcting of aging problems of a minor sort, there are a large number of things that break and have to be replaced, adding up to $55.4 million. The $55.4 plus the strategic radar, $65.5 million, and some of the environmental control systems add up to all of the Class IV modifications which you can really attribute to correcting the aging systems.

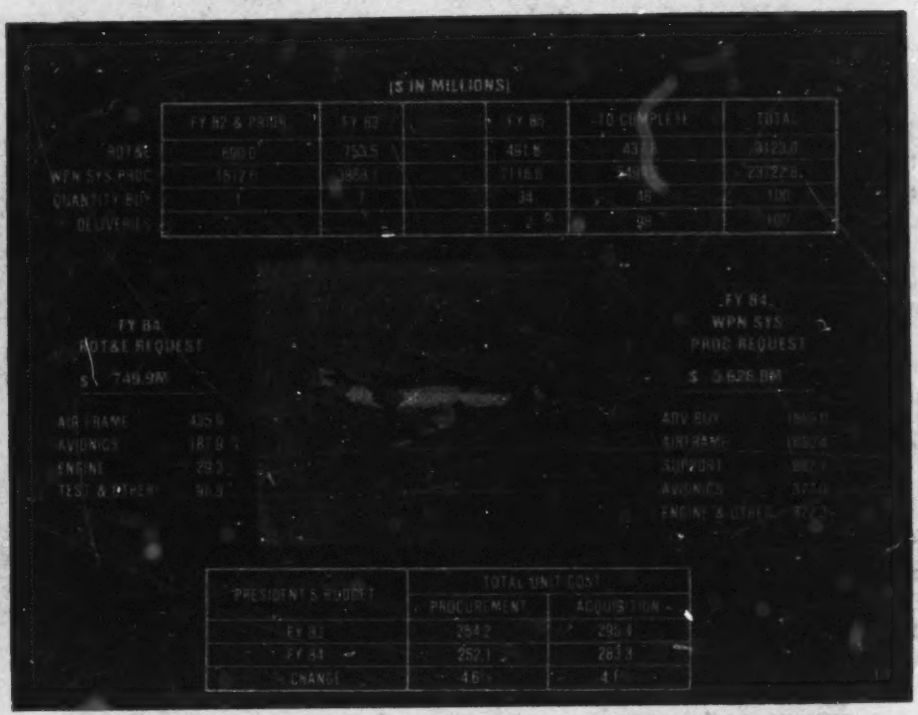
B–1B

Multi-role strategic bomber: Flexible, capable, available (IOC 1986).

This is the introduction for the B–1B program. I am not going to dwell on this, but simply give you overview data. We have General Thurman here to tell you about that program.

I want to emphasize, though, that the B–1B is a multirole strategic bomber. That was our proposal. That was confirmed by Congress in public law and I think that is a very, very important matter.

It is a flexible airplane and we can do a number of missions—do them all well. It is capable of doing those missions. We have a program coming along very, very nicely to provide us with initial operating capability of one squadron in 1986.



This is the standard format slide to give you an overview of the budgetary aspects of the program where we have listed the research and development on the top line, the weapons system procurement on the second line, and then the quantities requested for authorization and the delivery schedule which then comes a few years after the authorization.

In 1983, the Congress provided us in research and development $753.5 million and in procurement $3,868.1 million. In fiscal year 1984, we are requesting $750 million in research and development and $5,628.8 million in procurement.

We are requesting authorization for 10 aircraft and, as you know, sir, from the letter we sent to the Congress last month we are also requesting a multiyear procurement starting in fiscal year 1984.

You will notice, just to make sure there is no confusion, that this is a program for a hundred aircraft. The then year total is $23.723 billion in procurement and another $3.123 billion in research and development.

You may remember that that program when factored to 1981 dollars is within the $20.5 million contract between the President and the Congress for bringing this program in.

Senator WARNER. I think you had better put in what you are using as flyaway cost for a hundred aircraft.

General THURMAN. In this year dollars, it is $140 million a copy.

Senator WARNER. That $5.6 billion represents long lead for next year?

General THURMAN. Yes, sir; it has a number of elements. It has support in it, long lead for future airplanes, along with procurement of the actual aircraft. So, it has all of those totals included.

Senator WARNER. Your flyaway cost of the particular aircraft will remain unchanged from fiscal year 1983?

General THURMAN. Yes, sir.

General WELCH. I might remind you that the "To complete" column here is completed in fiscal year 1986. I will say that your point is well taken, Senator Warner, because in that year for less money than we are requesting for fiscal year 1984 even in then year dollars, not accounting for inflation, that will cover 48 aircraft.

These programs are done in an efficient manner, so that we don't drag it out, have years and years of overhead piled on top of one another.

You do get this situation that in the early years it looks like the unit costs are very high and in later years it looks like the unit costs are very, very low. Both of these are incorrect; you have to look at the matter. You have to go beneath the program where they are, in fact, produced on an efficient basis.

This breaks out in particular on this slide the fiscal year 1984 weapon system procurement request. Out of the $5.6 billion shown, $1.8 billion is in advanced procurement for future aircraft buys and $882 million is in support equipment. The airframe, avionics, and engine funding shown here, is $1,680 million for the airframe, $377 million for avionics, $822 million for the engine, and other is associated with what you would call the aircraft itself.

With regard to our estimates, down here are the total unit costs, procurement and acquisition, and they show a 4-percent decrease in our estimate this year as compared to last year's estimates.

The RDT&E request is primarily on the airframe, the avionics, the engines, and for test for a total of $749.9 million.

I won't go into this because General Thurman will get into this.

Dr. COOPER. This funding, Mr. Chairman, that you see does assume that the Congress gives us the authority to go forward with multiyear in fiscal year 1984.

If that authority is forthcoming and we are allowed to use fiscal year 1984 funds rather than request additional funds by rearranging the funding to take advantage of economic order quantities in fiscal year 1983, that will require statutory relief in fiscal 1984 because of a provision that appeared in the appropriations bill last year relating to multiyear.

Senator WARNER. Have you made such a request?

Dr. COOPER. It is in the budget appendix that came over, but we do not have it formally in the bill at present. There would be a one-sentence piece of statutory language that would have to be included in order for us to go forward with multiyear in fiscal year 1984.

We anticipate that if we are given that authority, that we will be able to effect savings on the order of approximately $800 million ex-

pressed in constant 1981 dollars, which is consistent with what the Department indicated in 1981 when the program was originally laid out and the Congress accepted that program.

So, we do need assistance if the Congress sees fit to allow us to go forward with multiyear.

AIR LAUNCHED CRUISE MISSILE (ALCM AGM–86B)

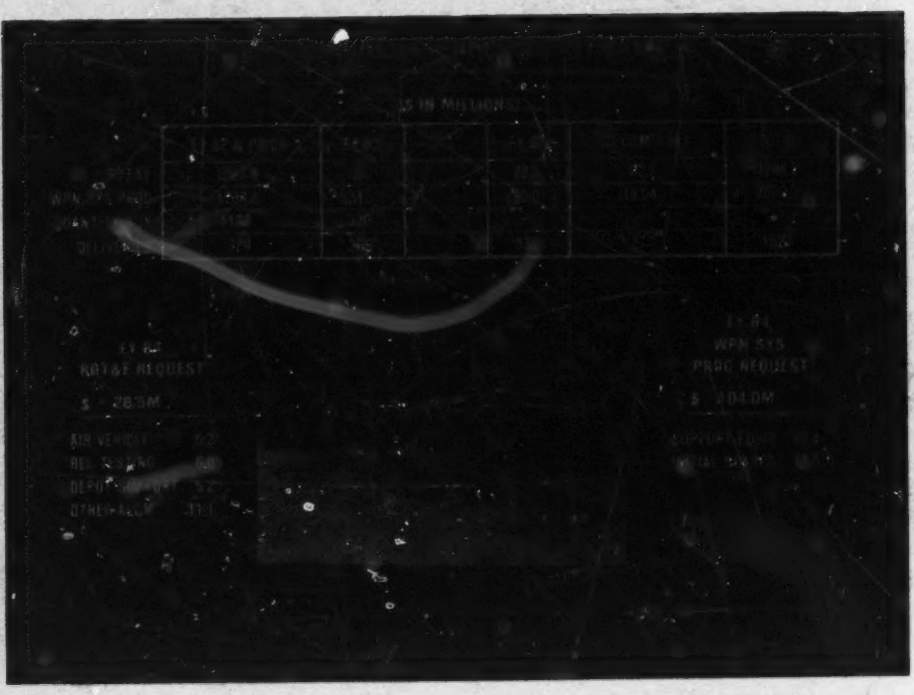
Small, accurate, long range, air to ground missile for use with the bomber force.
Small radar cross section for survivability.
Initial operational capability—December 1982.
First B–52G squadron at Griffiss AFB, N.Y.

General WELCH. Turning then, Mr. Chairman, to the air-launch cruise missile and in particular to the AGM–86B, to remind you, this is a picture of the missile. It looks a little ungainly in the picture. It looks like the wings are not nearly large enough to support it.

As you know, long, thin, narrow wings are highly efficient. It really works amazingly well. This is a small missile. It doesn't reach from here to you. It is shorter than that.

It is long range, in the neighborhood of 1,500 miles. It is an air-to-ground missile for use with the bomber force. It does in fact have a reduced radar cross section compared to what you would naturally think for objects of this size. That is, it has special treatment.

Its initial operational capability was predicted to be December 1982 when we started the program and I am pleased to report it was December 1982. Not only that, but we anticipate that we will have a second squadron become operationally capable at the end of this month. The first one was at Griffiss Air Force Base in New York.



Now, to look at the program summary, for research and development we are requesting in fiscal year 1984, $28.5 million for RDT&E which is winding down.

As I said, $104 million is for procurement of support equipment. You will notice in the authorization quantity line that we are, as submitted by the President, requesting any quantity buy in 1984 in anticipation of a transition to the advanced cruise missile.

As you know, we have testified previously on the advanced cruise missile program. We are in the process of evaluating those costs and are on schedule and the question is exactly how to phase those two programs together. We will announce our decision shortly on that.

The delivery is in fiscal year 1984 for earlier years, we expect 444 to be delivered in fiscal year 1984 and 339 in fiscal year 1985. As you see, the fiscal year 1983 and prior buys will finish delivery in early 1986.

Deliveries do lag the budget and, of course, the budget preparation is in anticipation of the years. So, we are today talking about 1984 which, if we were going to produce missiles, would be delivered in 1987. It is a long time between a decision and getting it on the ramp.

I don't believe there are any significant areas in those other requests to discuss.

KC-135 REENGINING

Adds refueling capability at least cost.
Additionally:
    Adds operational flexibility.
    Reduces environmental impact.
    Conserves fuel.
Began mod—February 1982.
First flight—August 1982.

The final program that I would like to deal with this morning is the KC–135 reengining. As I mentioned earlier, this has refueling capability at the least cost. We have gone through this. This was probably the most well-studied program in regard to alternatives that we have had for an awful long time.

The KC–135 reengining was a subject that I first looked at in June 1969 and others have looked at it before then. We finally got the program underway in the last 2 or 3 years. I am very pleased with the support that the Congress has given us heretofore.

We get good operational flexibility, reducing the environmental impact, conserving fuel. The program began in February 1982. We had the first flight in August 1982. The development, test and evaluation was completed last week and the airplane will move to the operational test and evaluation phase starting next month.

We are very pleased with the progress.

The budget request for the KC–135 squadrons is shown here. This is $11 million in RDT&E, $995 million in procurement modifications. The procurement request is primarily in Class V modifications. That is capability modifications, at $937.1 million. We have reliability and life extension mods at $58.4 million.

The RDT&E is primarily for the CFM–56 at $8.3 million. Some other refueling improvement, $3 million.

You will see that in fiscal year 1985 that program also continues to get larger here, $1,558.2 million in modification, as we increase the

KC-135 SQUADRONS

($ IN MILLIONS)

	FY 82	FY 83		FY 85	FY 86-88	TOTAL
RDT&E	28.9	29.0		9.4	12.0	CONT
MODS	392.3	546.2		558.2	4554.9	CONT

FY 84
RDT&E REQUEST
$11.3

CFM 56	8.3
REFUELING IMPMTS	3.0

FY 84
WPN SYS
PROC REQUEST
$995.5

CLASS V	937.1
CLASS IV	58.4

21

E-3A

	82 & PRIOR	FY 83		FY 85	TO COMPLETE	TOTAL
RDT&E	82.6	26.3				97.2
MOD PROC	2460	371.9		1382.5	2963.5	6933.8
O&M	33			30.1	224.4	273.3
QUANTITY BUY	10	19		65	209	334
DELIVERIES	1			31	300	334

FY 84
RDT&E REQUEST
$ 8.3

CFM 56 8.3

FY 84
MOD
PROC REQUEST
$ 875.8

MODIFICATION	635.9
ADVANCE PROC	254.3
ADV PROC CREDIT	14.0

PRESIDENT'S BUDGET	TOTAL UNIT COST	
	PROCUREMENT	ACQUISITION
FY 83	21.5	22.4
FY 84	22.3	23.5
CHANGE	3.7%	4.9

number to 65 in fiscal year 1985. That program also continues for several years.

You can see that a little bit more clearly here in the larger breakout.

In fiscal year 1984, we are requesting 31 quantity kits. We are also requesting the beginning of a multiyear program in fiscal year 1984 for the major portion of this program. I say the major portions because, as you know, in our multiyear we are careful to restrict; even within a program, not all of the appropriations goes on multiyear.

The F–16, for example, the engine has been a separate matter, furnished GFE. The avionics upgrade in the F–16 will follow our year out in the multiyear request. In this case, the multiyear request is limited to the hardware that is bought for the airplane. The installation of the kits onto the airplane is not in multiyear, but is a separate matter.

It is more amenable, we think, to control through an annual buy. It is important to realize that we do make that distinction. When you see the dimension, in this case, of the KC–135, only about a third of the dollar value is covered in multiyear. So, you will see funny numbers in the multiyear request. I just want to explain why that is.

This program then will continue at 65 kits in fiscal year 1985. Seventy-two is our current planning for the next several years. That will go on. The multiyear covers about 300 airplanes or about half of the tanker force.

The total unit cost is keeping fairly stable. Unfortunately, we do have to report a 3-percent increase in our estimate in unit cost this year as compared to last year.

That concludes my briefing that I wanted to cover with you this morning. I will be happy to answer any questions.

Senator WARNER. We are going to move right along.

Senator Stennis, do you have any questions?

Senator STENNIS. No, thank you, Mr. Chairman. This is a mighty good hearing.

Senator WARNER. Counsel will submit a list of questions. We want to continue with other witnesses rather than go into questions at this time.

Dr. COOPER. I might suggest if that is the case, that General Thurman present his briefing on the B–1B.

STATEMENT OF MAJ. GEN. WILLIAM E. THURMAN, U.S. AIR FORCE, DEPUTY FOR THE B–1B, AERONAUTICS SYSTEMS DIVISION

General THURMAN. Good morning, Mr. Chairman.

I have a prepared statement. Because there is some redundancy in the facts in that statement and the briefing, I would suggest that I submit that for the record.

B–1B PROGRAM

We are quite proud of the start we have in the B–1B program. In fact, we have one of the best starts for a major development production program in memory. Realize this is only the beginning of the race. The race is not over until we finish the program.

Certainly we believe that where we are now contributes to our confidence in that $20.5 billion.

That is a picture of B–1A No. 2 airplane that just completed its fourth flight yesterday. It is part of a weapon separation and handling quality test that is part of the B–1B program. We actually have that flight test program underway.

Senator WARNER. General, at some point, I would like to have you touch on the sudden production-line shutdown in this program, 48 units in 1983 and then, boom, like that, zero in 1987. I am sure you have analyzed that. That is somewhat unusual.

General THURMAN. Yes, sir. Actually, the last of those aircraft will be delivered in 1988. It gives a very abrupt dropoff, but the people will be phased out of that program over 2 years should the program be terminated.

Dr. COOPER. Were you going to comment further on that?

General THURMAN. I had not planned to.

Dr. COOPER. I was going to mention, Mr. Chairman, the reason we ramp up, we started with one aircraft a couple of years ago, we go to seven. This year, we are requesting authority for 10; next year we go to 34, and then the final buy 2 years from now will be 48. That is driven by the requirement.

It is a management challenge for us to meet the $20.5 billion figure that the President and the Congress have agreed to previously. That is what drives those particular numbers. If you stretch it out over a longer period of time, then, of course, the cost goes up.

OUTLINE

Background and capability summary.
Schedule progress.
Cost performance.
B–1B production team and facilities.
Flight test program.
Multiyear procurement.
Summary.

General THURMAN. We will cover in the briefing these points and talk a bit about multiyear in the summary.

PROGRAM DIRECTION

Price ceiling of $20.5B (fiscal year 1981 dollars).
Periodic reports to SEC DEF.
Integrate ALCM carriage.
Multiyear required.
Logistics support included.
Design baseline frozen.
Exclusions: Interim contractor support, manufacturing technology, simulators.

First, for background, the President certified to the Congress that we could bring this program in within the $20.5 billion baseline ceiling that was described. Almost half of the development program is on contract. Twenty-three percent of the production program is on contract.

We are under our budgeted amounts in both of those areas. About 25 percent of the program is currently on contract. We are under budget. Therefore, it gives us some confidence we can hold to the $20.5 billion for the total program.

We were given some specific direction by the Department of Defense and Secretary of Defense when the program was initiated.

The $20.5 billion is a number that we live with in the program office every day. We give reports directly to the Secretary of Defense.

This is the only major program on which he receives biweekly reports. The next one of those reports is scheduled for April 22. He is personally interested in our progress on this program and personally monitors that progress on a biweekly basis.

We are carrying cruise missiles onboard the airplane both internally and externally.

There are a few things that are left out of the program, which is typical of a lot of programs that we have, but the bulk of all the aircraft and support are included within that $20.5 billion baseline number.

Dr. COOPER. Mr. Chairman, you asked if we had submitted a request to you as far as the language that we would need.

With your concurrence, I would request permission that we be allowed to comment on that for the record——

Senator WARNER. It is very important that we have that.

Dr. COOPER [continuing]. And submit the particular language that we feel we would need. We can do that for the record if that would meet with your approval.

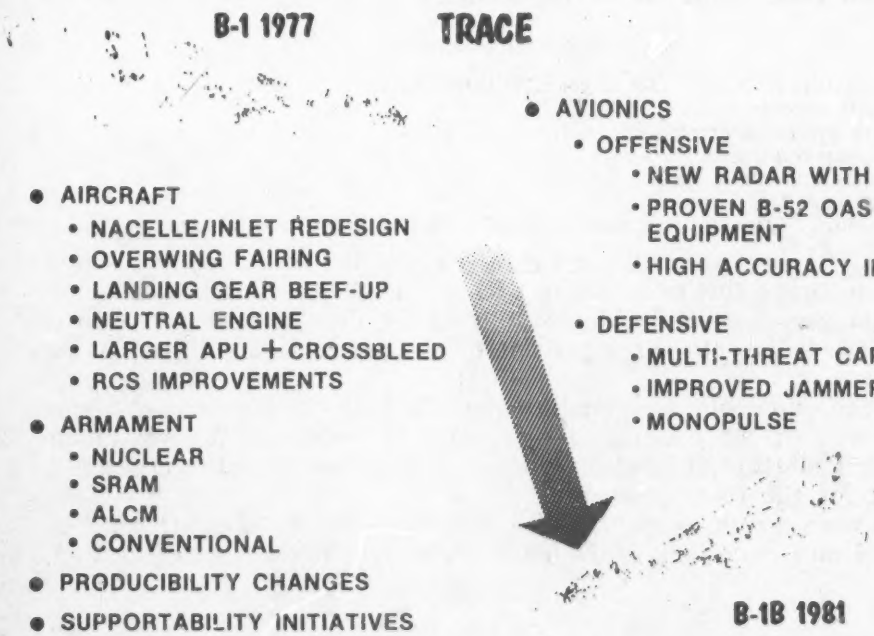
[The information follows:]

CONGRESSIONAL LANGUAGE

The following language is submitted to facilitate Congressional approval of the B–1B multiyear procurement program.

PROPOSED COMMITTEE REPORT LANGUAGE

This language permits funds appropriated in fiscal year 1983 to be used to initiate multiyear procurement of B–1B aircraft. In addition, a realignment of funds is required in order to purchase economic order quantity items in fiscal year 1983. The Committee directs that $185M be transferred from the B–1B weapon system to advance procurement for fiscal year 1983 to fund these economic order quantity items.



General THURMAN. The B–1B today is very similar to the B–1A, a program that was terminated in 1977. As far as the aircraft is concerned, externally it looks virtually identical. I will show you the two changes you will notice in the airplane.

We have expanded the armament that it can carry, not only nuclear, but conventional weapons. We have provisions for any of the new classes of conventional guided weapons so that this aircraft does have tremendous flexibility in a variety of roles, both conventional and nuclear, in various places around the globe.

We have made some other changes in the airplane that will make it easier to support so that we are assured of the availability of the airplane should that need occur.

A major change in the airplane is the thing you do not see and those are changes to the offensive and defensive avionics systems. What we have done in both cases is capitalize on the latest avionics equipment that is available and new technologies that are available for those avionics.

We are replacing old avionics with much more capable systems onboard the airplane. I will describe a couple of those in the next chart.

DEFENSIVE AVIONICS—STATE-OF-THE-ART DESIGN

Fully power managed.
Fully integrated.
Adaptive ECM.
Technique optimization.
Modular growth oriented.
Software reprogramable.

The defensive system is an extremely capable system that can defeat all known threats today and also has in it the inherent ability to handle the new threats the Russians may come up with, principally with software changes as opposed to hardware.

We think we have a tremendously capable system here that can grow to accommodate threats we see in the future.

One of the changes that you notice in the aircraft is that in the original airplane, there was a vertical inlet. We have a variable geometry inlet emphasizing supersonic speed.

In this aircraft we have a fixed inlet and it is sloped so that we can reduce the radar cross section of that inlet and we have a device on the airplane that allows us to reduce the overall cross section, but particularly reduce the contribution to the overall cross section made by the inlet. We have a sloping leading edge, as opposed to the vertical.

Senator WARNER. What are we doing with the B–1A?

General THURMAN. We have four. Two of those are being used in the B–1B test program. The first flying today is our No. 2 aircraft. It will do our stores separation work.

The No. 4 airplane will be the first airplane of the B–1A to include both offensive and defensive avionics suites. That will start flying in the summer of 1984. It may be ahead of that July schedule.

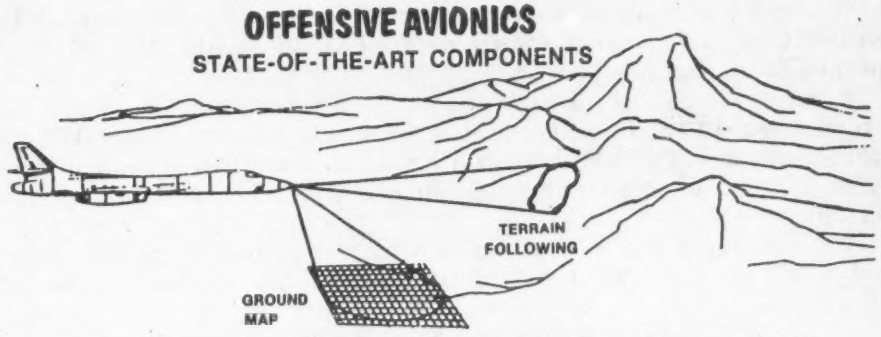
We will start to test the integration of all the avionics on the airplane at that time.

Senator WARNER. And the other two?

General THURMAN. The other two are being used for parts right now. They will not fly again.

In the original airplane, the overwing fairing had a distinctive break in it when the wings were swept. We found that this was a problem with maintenance and also it contributed considerable weight to the airplane.

We have smoothed out the fairing which reduces the drag, reduces the weight 1,500 pounds, and will be far more maintainable. That is the reason for this overwing fairing change. It will look smooth in the new airplanes.


OFFENSIVE AVIONICS
STATE-OF-THE-ART COMPONENTS
TERRAIN FOLLOWING
GROUND MAP
• OFFENSIVE RADAR SYSTEM
• HIGH RESOLUTION GROUND MAP
• REDUNDANT CHANNEL - TERRAIN FOLLOWING RELIABILITY
• MULTIPLE MODES - ELECTRONICALLY STEERED
• ANTI-JAM FEATURES
• GIMBALLED TO ALLOW SCAN 120° BACK
— CONVENTIONAL STANDOFF
— DAMAGE ASSESSMENT
— ADVANCED WEAPON CONTROL
• GROWTH CAPABILITY
• NAVIGATION: STATE-OF-ART HIGH ACCURACY
• LATEST INVENTORY ALTIMETER AND DOPPLER RADARS
• COMPUTATION
• AP101F: STATE-OF-ART WITH UPDATED DATA BUSES
• MASS STORAGE DEVICE: NEW
• 1553 DATA BUS

For the offensive avionics system, we have in this airplane the improved F–16 radar; in fact, we have two of those so that we have redundancy, about 70 or 75 percent common with the F–16. It gives you the ability to navigate to the target, using terrain following where necessary. It can find those targets, deliver the weapons on the target and, by the way, keep an accurate accounting of the weapons and the systems operational onboard.

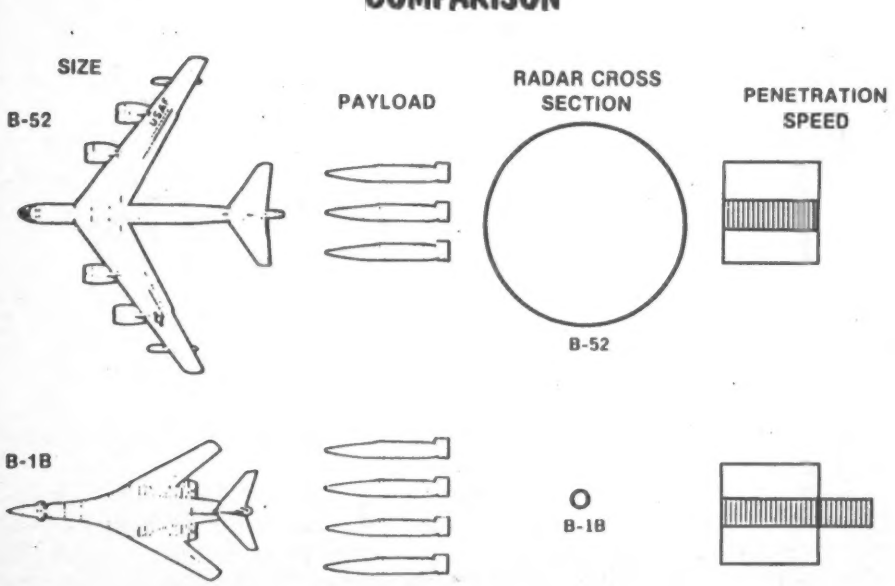
It also allows us to integrate the defensive system into the avionics. The radar picture is so accurate it looks more like a photograph, as opposed to a typical radarscope you have seen before which contributes considerably to the accuracy with which we can deliver these weapons.

We have an improved navigation system that gives us tremendous accuracies, the best we can provide today. Then we have the latest in computers that gives us a much better capability to store target information and keep track of the defensive systems that the airplane will be facing.

The defensive avionics are the most capable that we have ever put together. This system has been in development now since the original program. So we have high confidence in its ability to defeat the kind of threats—we have flown it against threats of the type the Russians are just now beginning to build.

We find it can defeat them. It listens to all radio frequency energy. It decides which of those emissions are threats to the airplane and automatically decides the appropriate countermeasure that should be used, whether that is noise jamming or spoofing or flares or chaff.

The operators monitor the operation of the system and then decide if the system is putting appropriate emphasis on the threat and they can reprogram it inflight to address a new threat or put more of the countermeasures on a particular threat that they think is a danger to the airplane.



If you compare the B–1B to the B–52 that it will replace in virtually every category, the airplane is superior. The B–1B is a little bit smaller than the B–52, but it carries about twice the payload.

For instance, in nuclear weapons, it will carry a 4-to-3 ratio. In conventional weapons, it will carry internally some 84 500-pound bombs. The B–52 will carry internally only 27.

With internal and external carry, on the B–52, you can carry 51 bombs versus the 84 that we will carry internally here.

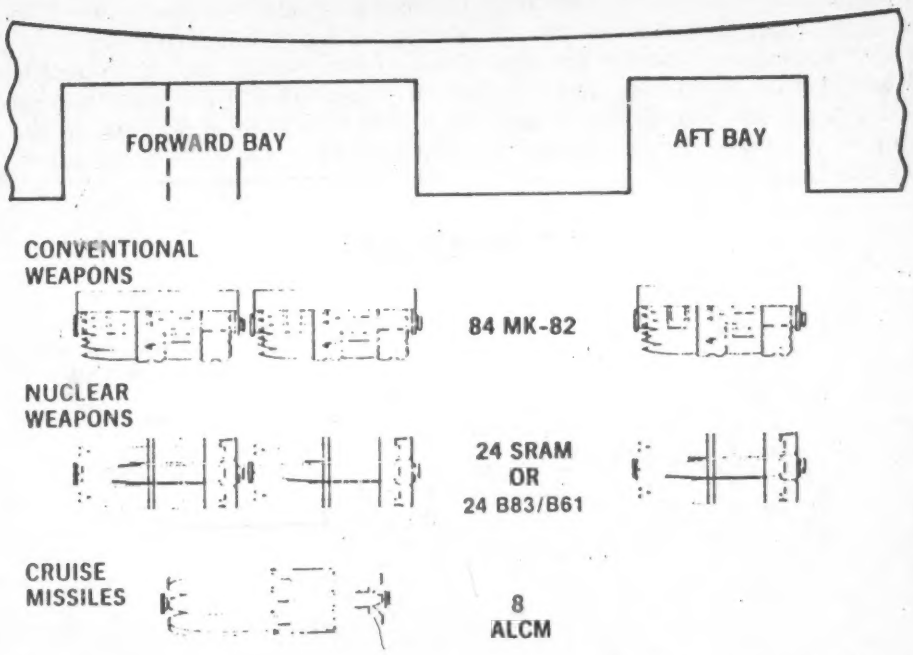
The radar cross section is a considerable improvement over the B–52. We have reduced the radar cross section to a one-one hundredth on the B–52.

The important point we make is because the penetration speed is so much greater, the pilots' exposure in high threat areas is considerably reduced. We find the B–1B will be in high threat areas about an hour and a half less than the B–52. That translates into survivability because the pilots will spend less time being shot at.

I was a fighter pilot in Vietnam and I know how important it is to have as little time as possible for people to shoot at you.

If you look at the versatility of the payload onboard the airplane in the three weapons bays that we have onboard, we can carry vir-

PAYLOAD VERSATILITY



tually any nuclear or conventional weapon that we have in the inventory or are planning for the inventory.

I mentioned the fact that we can carry the 84 500-pound bombs. That includes not only the iron bomb, but a sea mine version of that bomb. We can carry 24 nuclear weapons in the three bays, SRAMS or the B–61, the current nuclear bomb, or the B–83 which is the new bomb currently being developed, or eight cruise missiles in the forward bay and use fuel in the aft bay or some SRAMS in the aft so that we can carry a combination of weapons and fuel to extend the range of the aircraft.

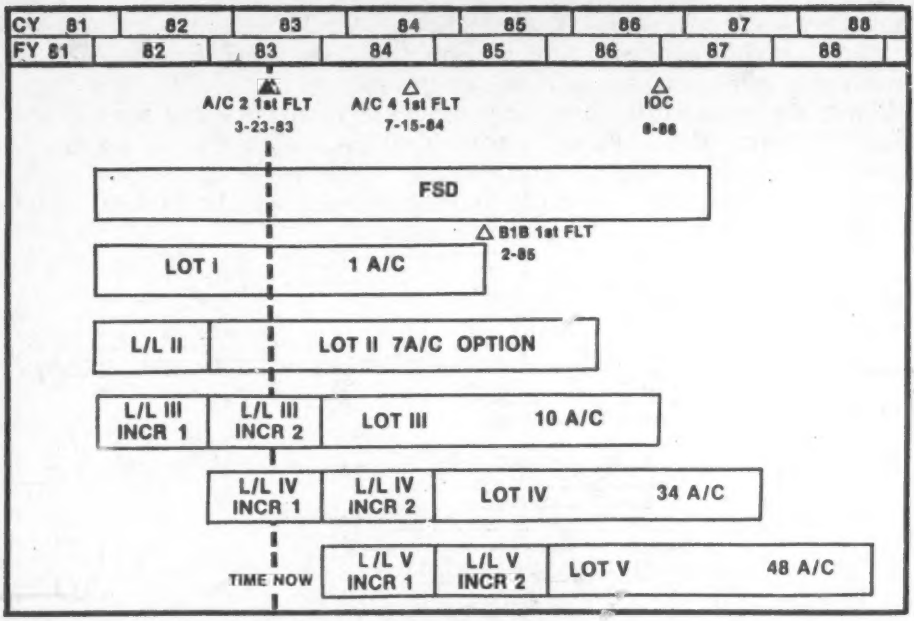
Now, for the schedule progress to date. We are at this point in the program. When we started the program in 1982, we awarded the full-scale development contract for the entire program plus lot one which is the first aircraft and two increments of long lead.

Because of the pace of the program, we have to provide 2 years of long lead for the aircraft. In 1983, we awarded the second lot, which is seven additional airplanes plus two more increments of long lead.

In 1984, we will award the contract for lot three which is 10 aircraft plus 2 more increments of long lead. So we will essentially be buying materials for all 100 airplanes when we start fiscal year 1984.

This means that we will have about 63 or 64 percent of the total program on contract at that point. So, we will be well along with the development and production of those 100 aircraft.

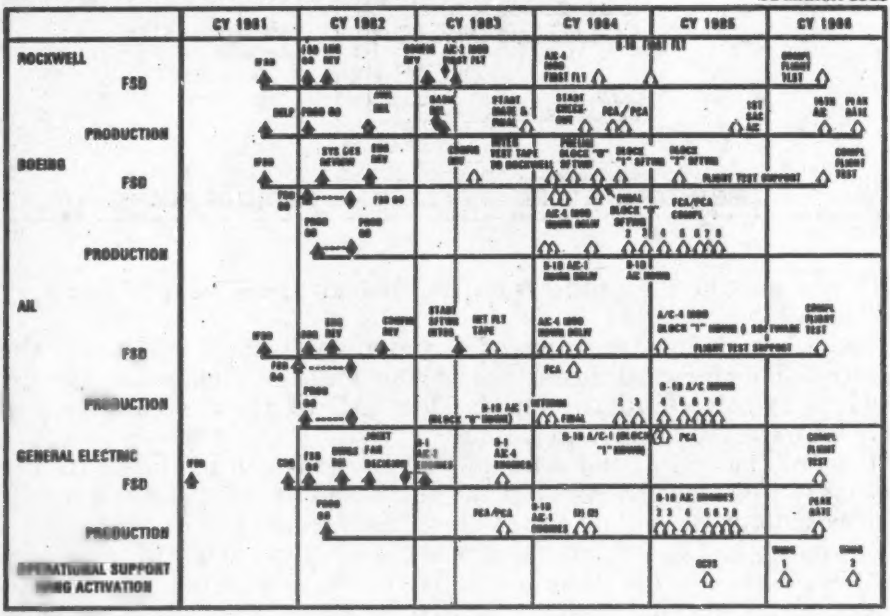
B-1B CONTRACTUAL SEGMENTS



ASSOCIATE CONTRACTOR

SUMMARY PROGRAM OPERATING SCHEDULE B-1B

DATA AS OF 31 MARCH 1983



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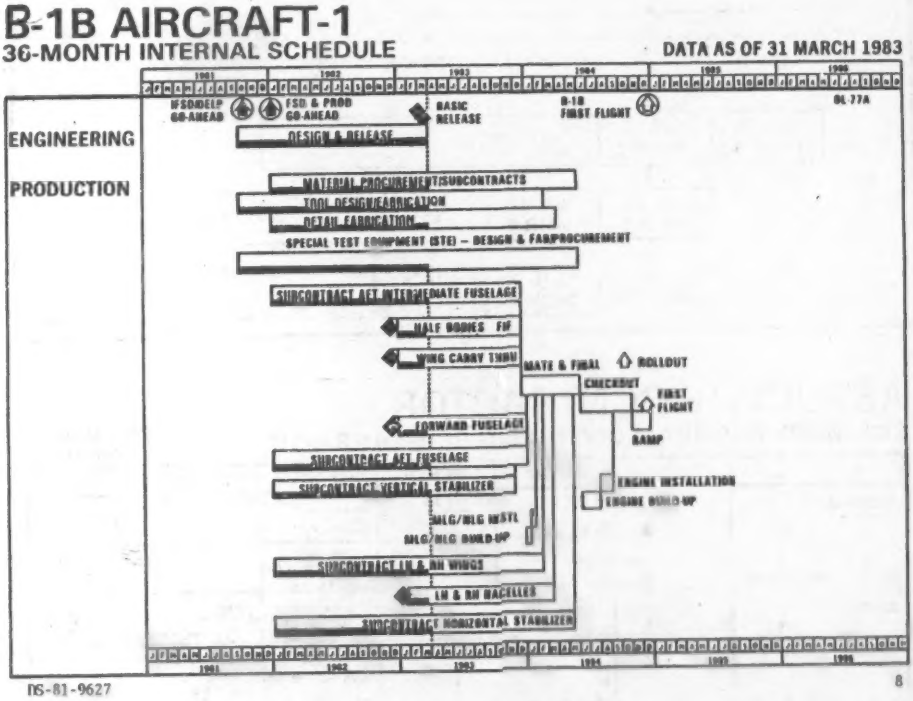
We have a different kind of program structure here in that the Air Force does not have a prime contractor, but we have contracts with four associate contractors. In essence, the Air Force is the prime contractor for this program and we are then contracting with each of these companies for a piece of the program.

These are some of the major milestones that we have met in calendar years 1982 and 1983. We are meeting all the major milestones or are ahead of schedule. We are starting software integration for the defense system and completed all the engineering for the first airplane. We are well along in meeting our milestones.



If you look at the progress on the first airplane, we are also very well along.

These are various portions of the airplane being built across the country. The forward fuselage is being built in Baltimore, the aft fuselage is being built in Dallas, Tex. All of those major sections have been started. We are well along.

Toward the end of the year we will start mating of the airframes so that it will look like an airplane at the end of this year and it will be checked out for rollout for the first flight at the end of 1984.

If you go to those factories across the country, you will see major sections. This is a fuel tank assembly that is now in one of the most modern machines that we have for driving rivets. This is an automatic riveting machine. You see some of the people using that new technology on this major section of the aircraft.

This, by the way, was at Palmdale.

This is the top deck assembly. This is the top portion of the aircraft just behind the cockpit. It is being built in Columbus, Ohio. You see that it is in its final assembly state there.

CONTRACT COST PERFORMANCE

($M — THEN YEAR)

PURPOSE/ CONTRACTOR	CONTRACT INFORMATION				COST VARIANCE					
					TO DATE			P.O. EST AT COMPL		
	TYPE	QTY	TGT COST $	% COMP	$	%	EVAL	$	%	EVAL
DEVELOPMENT										
AIRFRAME ROCKWELL	FPIF	0	1188.9	38.0	9.9	2.2		0	0	
OFFENSIVE AVIONICS BOEING	FPIF	1	402.8	25.5	2.4	2.3		0	0	
DEFENSIVE AVIONICS AIL	FPIF	0	176.9	39.3	2.8	4.0		0	0	
ENGINE GENERAL ELECTRIC	FPIF	4.8	163.5	56.4	-1.5	-1.7		0	0	

SATISFACTORY MARGINAL UNSATISFACTORY

B-1B PROGRAM

Actually, by now the skin has been placed on this and it is in storage awaiting the final assembly in the aircraft itself.

The wing carry-through structure is part of the fuselage to which the wings are attached. This is the upper deck assembly. You see it in its fixture in final mating. It has gone into the final mating fixture, again in Columbus. This major section of the airplane is being assembled.

If you look at this, you realize how big the airplane is. This is 30 feet across and it will be about 8 feet tall, so it is a big section.

This is the fairing that ties the wing of the airplane to the fuselage. This happens to be constructed in Tulsa. You see it is in this assembly picture in its final fabrication.

In addition to the pieces of the fuselage we have an awful lot of avionics hardware. This shows some avionics hardware in New York City.

These are some of the LRU's that are being built. This is one of them in factory test. You can get a feeling, I guess, for the cost of the factory test because all these wires are test wires that show the state of health of the various components of those LRU's. Here is one of them in test in New York now.

The engine has been assembled, in fact, the first production engine is in final assembly now. We have all the parts for that engine.

This is one of the four engines that we have in the engine development program. Using the afterburner it is in test at both Cincinnati and Tullahoma, the Air Force facility there.

Now, for cost performance. We are quite pleased with the progress we are making now. The first cost is just the development cost. These

are the total costs. This is from the associates cost performance reports up to this point. It shows their work on both lots 1 and 2.

You will notice this development now there are 38, 39 percent, in the case of the engine, over half completed with that development program, and all of them, with the exception of GE that is slightly above target, are underrunning their cost by some 2 to 4 percent.

We are expecting that they are going to be on target cost or slightly below the target cost at the completion of the program.

CONTRACT COST PERFORMANCE

($M — THEN YEAR)

PURPOSE/ CONTRACTOR	CONTRACT INFORMATION				COST VARIANCE					
					TO DATE			P.O. EST AT COMPL		
	TYPE	QTY	TGT COST $	% COMP	$	%	EVAL	$	%	EVAL
PRODUCTION										
AIRFRAME ROCKWELL	FPIF	8	2832.5	27.0	13.1	1.7		0	0	
OFFENSIVE AVIONICS BOEING (LOT I)	FPIF	9	299.1	15.0	1.1	2.6		0	0	
DEFENSIVE AVIONICS AIL (LOT I)	FPIF	4.6	279.3	20.0	2.0	3.6		0	0	
ENGINE GENERAL ELECTRIC (LOT I)	FPIF	4	99.4	28.0	1.5	5.5		0	0	

SATISFACTORY MARGINAL UNSATISFACTORY

B-1B PROGRAM

In production cost we are not as far along. You will notice a quarter of the program is essentially finished now. All of the contractors are underrunning their production costs and in some cases they are underrunning considerably as the charts show.

Again we are forecasting that we are going to be within those production cost numbers at the completion of the program.

We are building the aircraft with a team of contractors. We have the four associates that I mentioned that are building the parts of the aircraft and some 5,200 subcontractors and suppliers across the Nation. Virtually every State in the Nation has some action in the B–1B program.

We are building this aircraft in the most modern facility we have available today and we are doing things to make those facilities more modern. The companies are investing their money to further modernize their facilities so that we can drive the production cost as low as possible.

These show some of the facilities available to us. There is a major plant that the Government owns at Columbus where the center fuse-

lage and forward wing fuselage and carry structure is being constructed.

At Tulsa another Government plant is building a lot of flaps and the bomb bay doors and a lot of the composite materials for the aircraft. Columbus, Ohio, is where the other portions are that I mentioned.

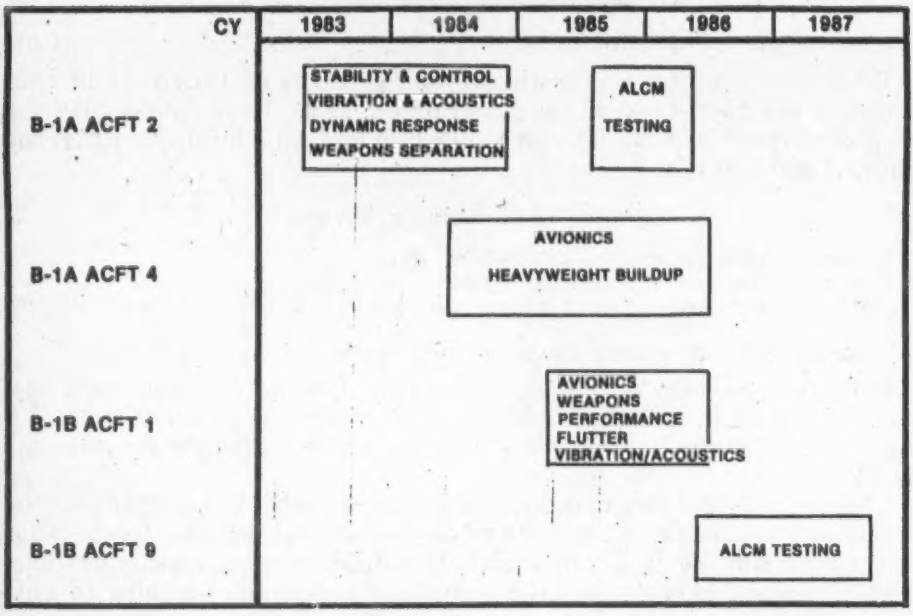
In El Segundo, they are building the forward fuselage area. It is going to come together at Palmdale in the new facility Rockwell is building out there with an investment of over $200 million of their corporate funds.

The next chart shows a picture of the new facility. The aircraft will be assembled in this new building. This picture is a few weeks old. They now have the side walls on the building. It will be checked out in the other building at the other end.

We are building those plants with some of the most modern technologies that we have in machine tools. This is a Rockwell-purchased 22 biaxis milling machine from Cincinnati Milicron. It is the largest machine order we have placed.

All those tools installed are making parts for the B–1B. Across the country literally thousands of suppliers are building small portions of the airplane and supplying materials for the aircraft.

DT&E/IOT&E PROGRAM



Now, for the flight-test program. We started the flight test on the 23d of March. We had the first flight of the aircraft. Now we have four flights. We are exploring things like stability and control with new systems onboard.

The vibration in the weapons bay, as we fly at very high speed and low altitude—those acoustic noises—can become very severe. So we

are exploring that in the No. 2 airplane. We will actually separate weapons.

Next summer we will start to fly B–1A No. 4 airplane with the new avionics and bring that in in the fall with the first of the new B–1B aircraft. We will do some ALCM testing on the No. 2, separate work and complete that on aircraft No. 9.

That completes the test flight program that we have.

B–1B MULTIYEAR STATUS

Multiyear funding requirements in fiscal year 1984 President's budget.
Congressional committees notified—March 17, 1983:
  $800M savings achievable.
  Based on mid-fiscal year 1983 start.
Multiyear proposal analysis on-going.
Air Force prepared for:
  Fiscal year 1983 economic order quantity start.
  Fiscal year 1984 multiyear start.

Now for multiyear we have asked for multiyear so that we can assure ourselves of the saving of $800 million in base year dollars, about $1.2 billion in then year dollars.

DEPUTY SECRETARY OF DEFENSE, MEMO TO SAF (Nov. 4, 1981)

"The Air Force should proceed with a vigorous multiyear contracting program to achieve the $0.8B savings presently projected."

Program baseline with multiyear	$20.5B
Projected multiyear savings	.8B
Program baseline w/o multiyear	21.3B

When the program was initiated the Secretary of Defense sent this memo to the Secretary of the Air Force and said we should proceed with multiyear so that we can achieve safety and hold the program down to $20.5 billion.

SOURCE OF MULTIYEAR SAVINGS

Economic order quantities (material buy-outs).
Fewer set up costs and longer part runs.
Stable business base which reduces fluctuations in personnel and indirect rates.
Reducing inflation impact by performing work earlier than normal.

How do you save money in multiyear? One way is that you buy your materials in economic order quantities, not in annual chunks. We are buying the airplane as you would buy materials in the commercial market.

Virtually all the commercial aircraft are purchased using these economic order quantities procedures. So we are asking that we be able to do that for the B–1B material. It would be more than just long lead. It is not only to buy the long-lead materials, but also to buy whole sections or boxes of the airplane.

Senator WARNER. To take a simple example, the aluminum for this aircraft, you are buying now all the aluminum for the whole aircraft program of 100?

General THURMAN. No, sir. We are only buying the aluminum that is needed for the next year.

Senator WARNER. Give me an example.

Dr. COOPER. But we would, Senator Warner, if we had permission to go forward with multiyear, we would try to buy in economic order quantities, so rather than buying 1 year in advance we would reach out 2 and 3 years.

Senator WARNER. You are seeking statutory authorization to do that?

Dr. COOPER. Yes, we are. Mr. Chairman, I understand you are pressed.

I believe General Thurman has three or four more slides.

Senator WARNER. We will take as much time as necessary.

General THURMAN. To answer your question, we are buying some multifunction displays in the cockpit. We have to buy those just for the numbers of airplanes that we are procuring that year. So we are buying in 8 or 10 quantity lots.

Senator WARNER. If you bought 100——

General THURMAN. We could save 35 percent on those multifunction displays. It is much smarter to buy 100 and put them on the shelf until you need them than to buy smaller lots and pay the extra price.

We would buy sufficient lots of aluminum stock or titanium. It is much as you would do in buying things for your home, buying soap and toothpaste. We have fewer setup costs. Typically, if you have a sheet metal part that conforms to a bracket, it will take 50 minutes to set the machine up and minutes to stamp out the parts.

It would be smarter to stamp out 100 of these parts and put them into bins as opposed to paying for all that setup time and building only a few parts. We would try to capitalize on that as well.

It would also provide a more stable business base so that the contractors can level their work force and they don't have to pay separation cost of hiring and laying people off. So, they can then plan their work force and their factory operations better.

By doing these things, which are up front things, we avoid inflation costs downstream. These are the four principal ways that we save money through multiyear.

Now, our requirements for 1984 are reflected in the President's budget and the numbers that General Welch showed you. We notified the committees of this request and the savings are achievable, again based on a start here where we would start to buy economic order quantities in 1983.

We are starting to do the analysis of those proposals that we received from the contractors so that we can negotiate a fair price for the Government with those proposals.

SUMMARY

B–1B program ahead of schedule and under cost.
First aircraft rapidly taking shape.
Design-production teams working well.
B–1B provides superior capability for multirole missions.
Multiyear procurement will provide large savings.

Finally, in summary, we are ahead of schedule and under cost now in the B–1B program. The first aircraft is coming together in those factories across the Nation. By the end of this year the major sections of the airplane will go together so that it looks like an airplane.

We have been able to hire the skills that we need to build this airplane and those are in place and they are working well. I guess I would say they are getting better. The airplane itself provides superior capability not only for nuclear penetration, but also a variety of roles—it is a multirole aircraft. We think that multiyear procurement is going to give the Government its best buy in dollars and allow us to make some considerable savings.

Sir, I will be happy to answer any questions.

[The prepared statement of General Thurman follows:]

PREPARED STATEMENT BY MAJ. GEN. WILLIAM E. THURMAN, SYSTEM PROGRAM DIRECTOR, B–1B, AERONAUTICAL SYSTEMS DIVISION, WRIGHT-PATTERSON AIR FORCE BASE, OHIO

Mr. Chairman, members of the subcommittee, it is indeed a pleasure to testify before you today in support of the number one priority in the Air Force's strategic modernization program, the B–1B bomber. The production of the first B–1B and subsequent aircraft continues ahead of schedule and below cost. We are well on our way to delivering the world's most modern strategic bomber within the $20.5 billion (in constant 1981 dollars) cost estimate certified by the President to the Congress in January 1982. The majority of the aircraft design and the experience of the Air Force and contractor teams combine to give us confidence the program can be accomplished within cost and on schedule.

B–1B CONFIGURATION

The basic B–1B aircraft is 80 percent common to the B–1A aircraft on which we have almost 1,900 hours of flight test experience. Thus, the B–1B development is primarily one of hardware and software integration. Significant changes include a redesign of the engine inlets to reduce the radar cross section, a strengthened landing gear to increase the maximum taxi and takeoff gross weight from 395,000 pounds to 477,000 pounds, and future carriage of air launch cruise missiles (ALCM) both internally and externally. Other minor changes have been incorporated to enhance producibility and durability, specifically in engine production enhancements. The defensive avionics systems, which was tested extensively during the B–1A bomber penetration evaluation program, has been expanded to provide greater frequency band coverage and encompass the latest countermeasure techniques to defeat or degrade the Soviet Union's modern look-down, shoot-down airborne interceptors, latest surface-to-air missiles, and airborne warning and control system (SUAWACS). The defensive avionics system capitalizes on modern, proven hardware from other operational Air Force weapons systems, such as the defensive avionics system (OAS) from the B–52 and the radar from the F–16. The results of these changes produce a B–1B bomber that can carry twice the payload of the B–52, penetrate at a speed that is 60 percent faster, and has a radar cross section some 100 times smaller.

PROGRAM STATUS

All four major associate contractors (Rockwell, General Electric, Boeing, and AIL) are working and maintaining an integral schedule that is a full three months ahead of their contractual commitment to the Air Force. The following comments regarding the contractors' performance are measured against that accelerated internal schedule.

The entire complement of aircraft drawings that are common to the B–1A were released in January 1982, and all of the required new or revised engineering drawings were completed in advance of the contractors' internal schedule.

Manufacturing shop fabrication orders (24,972) for the first production B–1B were scheduled for completion in May 1983, but were actually delivered in January 1983.

The second B–1B production efforts are also two months ahead of the accelerated schedule.

At Boeing the major effort is software development. To date, 4,860 of the 10,577 milestones should have been accomplished, but 4,885 have already been completed.

AIL's software development program has accomplished 110 of 126 total module designs, while the schedule has only called for 98 completions.

General Electric will deliver production engines later this year. Extensive test cell evaluations of the engine have shown it is exceeding specifications.

These facts illustrate the B–1B program is not only a full three months ahead of the contractual commitments, but also progressing in advance of the vigorous accelerated schedule in many important areas of production.

The flight test program for the B–1B was initiated on March 23 with the first flight of B–1A aircraft number 2. This aircraft has completed an intensive modification program to simulate the flight characteristics of the B–1B. The flight test profiles will evaluate vibration, acoustics, and weapon separation. Currently, B–1A aircraft number 4 is undergoing a similar modifications program to conduct flight tests of the new and modified avionics. Its first flight is projected for May 1984, two months ahead of schedule. B–1B aircraft number 1 is scheduled to start flight testing in December 1984, three months early. Every indication is that it will fly in advance of that date.

The B–1B logistics program is well underway. Utilizing lessons learned from the original B–1A program, the F–15 and F–16 programs and making maximum use of common support equipment existing in the DOD inventory, the B–1B will be supportable by Air Force maintenance crews at the first base. Intermediate and depot support will be initially provided through interim contractor support. This will gradually be phased out. By 1988, it is expected that the Air Force will achieve total "blue suit" supportability for the B–1B. The aircraft and all support equipment will be certified for the operational handling and utilization of the short range attack missiles (SRAM), B61 and B83 gravity bombs by our initial operational capability (IOC) date in September 1986. Certification of conventional weapons, including a sea mine, will also be completed by IOC. The ALCM will be certified within the B–1B baseline program using B–1B aircraft number 9 as the primary flight test vehicle.

CONTRACT COST PERFORMANCE

All production and development contracts are fixed price incentive firm target contracts. The production contracts include lot I and lot II for eight aircraft, as well as advance procurement contracts for long-lead items associated with lots III and IV (aircraft number 9–52). The contracts for the first eight aircraft are over 15 percent complete and reflect a favorable cost variance of 5 percent. The program's development effort is over 30 percent complete and we are currently 3 percent under budgeted cost. Multiyear contract proposals have been received from all associate contractors and are currently being evaluated.

CHALLENGES

The program is not without challenges. The software development, which does not impact hardware design or fabrication, is a challenge. Nuclear certification, because of its paramount importance, is always a challenge. However, we feel confident that the B–1B schedule can be met. Software development and nuclear certification require top-level management, and they are receiving it.

CONCLUSION

The B–1B program is in good health and gaining momentum. One of the major reasons for the success of this program has been the support given the B–1B by this subcommittee. Mr. Chairman, we thank you for that support. That concludes my remarks and we will be happy to answer any questions you or the subcommittee might have.

Senator WARNER. We do have one question here.

B–52 AIRCRAFT CRASHES

The committee is greatly concerned about the spate of crashes involving the B–52 aircraft. Perhaps you can elaborate on the recent crash, Mr. Secretary.

Dr. COOPER. Mr. Chairman, I will ask General Welch to comment on that.

General WELCH. Mr. Chairman, I think this particular crash reminds us all that the men and women who fly airplanes are giving a great deal to this country.

Senator WARNER. I have had some modest experience in aviation. I certainly appreciate that.

On the other hand, you know, taking 180 of these planes and rehabilitating them, it is awful hard to say in one breath that they are older than the pilots who fly them and that we are risking their lives and then turn around and try patching them up for another 10 years.

I don't think we can have it both ways, I mean from the standpoint of rhetoric.

General WELCH. I quite agree. For my own part, I never used that particular rhetoric that you refer to, nor will I recommend it to anyone to be used. I think you really have to go and look at the equipment and what you can do to it in an objective serious-minded way.

We have found in the B–52 program two important lessons.

One was that the first model, the B–52A, was not nearly the airplane we needed and it really was not until the G and H models that we got the full potential out of the basic design of those airplanes, primarily driven by engines.

The second thing we learned is that over the seventies, in particular, really substantial modifications could be made to the airplanes primarily in the way of adapting them to carry more modern munitions.

The first generation of that was the so-called short-range attack missile.

The second was the air launch cruise missile.

Those progressively took the airplane itself out of the combat arena. The short-range attack missile provides standoff ranges of 30 to 70 miles and the air launch cruise missile standoff ranges of 1,000 to 1,500 miles.

Now, I think it is important to realize that airplanes don't abruptly cease being useful, but you do have to make radical adaptations of that basic airframe in order to continue it in useful life. We do find that those modifications are a cost-effective way to go. It does preserve some tangible assets in training and skills and morale and unit integrity which is an asset that does not show up on the books too well, but is very important.

Senator WARNER. I fully appreciate that.

General WELCH. So I think you will find that, by and large, certainly the Air Force has tried to take a sober view of it and has not let something as important as our strategic deterrence be subject to slogans, rhetoric, and the like.

Senator WARNER. The aircraft coming through the mod program will come out as good airplanes, safe for the crews, and an integral part of the Air Force bomber leg?

General WELCH. I think that is exactly correct, sir. As you know, we have a very extensive depot maintenance. As these go through the major depot for the mods, we do a great deal of inspection to see if there is difficulty with corrosion, difficulty with wiring, and we have spent a lot of money over the years to make those improvements.

If you look back to the B–52 modification program, you will find structural beefing up in a number of areas, in the vertical tail, that I offhand remember, in the strength of the fuselage, and the like.

That is a thing that you have to continuously monitor. What will come up in the next depot level in looking for potential difficulties, we will just have to see.

Senator WARNER. General Shaud.

STATEMENT OF BRIG. GEN. JOHN SHAUD, U.S. AIR FORCE, DEPUTY DIRECTOR, PLANS, HEADQUARTERS, AIR FORCE

General SHAUD. Senator Warner, if I could make a few remarks, I have both flown and commanded the young people that are in this very realistic training environment at Red Flag. I had command of the projection force. We were flying at night over mountainous terrain frequently.

If memory serves me right, this unfortunate recent accident is in fact the first accident we have had on Red Flag with the B–52. I think the B–1B program would provide you a transition for the B–52 increasingly as a cruise missile carrier, the B–1B then picking up the load of penetration. It is just a useful and smooth transition in the future.

I think you have to speak to the morale of our young people, too, and seeing something on the horizon to replace the B–52 makes a lot of sense.

Senator WARNER. I fully appreciate the risks that the men and women of the Air Force take every day flying and operating the aircraft, be it a brand new one or an old B–52.

Gentlemen, I think we have covered to some extent this question of the shear line in 1986 and the 48 units. Particularly viewed from the standpoint of program management, what impact do you believe the decision of the Congress to restrict the rate of production of the B–1B to three per month will have on the overall program?

Dr. COOPER. Mr. Chairman, in a very basic sense, it would increase the cost. It would not be as efficient as the program is right now. Of course, there would be a less precipitous dropoff as you have already noted.

Senator WARNER. How much would it increase the cost?

Dr. COOPER. I don't know if we have looked specifically at the rate of three per month.

Have we, General Thurman?

General THURMAN. Yes, sir. There was a question by Senator Quayle about limiting the production rate to two and growing to three a month. We assessed that program. It looks like in then-year dollars, it will add over $8 billion to the cost of the B–1B program.

Senator WARNER. We are trying to run a side-by-side comparison of the management cycles with the ALCM. As you know, an adjustment of the procurement profile for the B–1B might avoid some of the cost experiences you have experienced in the ALCM.

Dr. COOPER. The concern, as I understand it, is that the 100th B–1B is going to be significantly less costly, or the 101st some people have alleged, would be significantly less costly than the first ATB. That is causing concern.

I would only suggest that in my view it does not make the situation any better if we mitigate that problem by increasing the cost of the 101st B–1B compared to the first ATB. That is basically what the suggestion is, that we stretch it out so that there won't be such a large cost disparity between the last B–1B and the first ATB.

We feel the program as we have it structured right now is an efficient program. I know of no other program in the Department of Defense at the present that is more efficient. That is probably the most efficient funding profile we could set forth.

Senator WARNER. I am going to ask you to talk informally and if necessary, have an exchange for the record here with our counsel of the committee. I think we have some serious concerns.

Having been on this side for so many years, you can understand the sincerity of our concern and I would hope you would work it out.

To the extent you can address in open session, how much importance does the Air Force attach to having a serious alternative, namely a warm production base capable of producing the B–1B aircraft, available as an incentive to manufacturers of the ATB to make their contract proposals as inexpensive as possible?

Dr. COOPER. Mr. Chairman, I just have to go back, and perhaps we are not interested in talking about history here, but about 18 months ago when this issue was debated previously and the concern was for the total program cost on the B–1B, Mr. Carlucci and Mr. Weinberger testified at that time and laid out a program that would bring the 100 B–1B's in for $20.5 billion.

That program contemplated a number of things and that one was the particular production rate that we presented to you today.

In addition, it contemplated going forward with multiyear procurement early on in the program. That is the program we have been managing to for the last 18 months. It is the most efficient program that we can put forward in terms of production rates and dollar costs.

If the ground rules are now changed to where we are more concerned about keeping a warm B–1B production line for a longer period of time, certainly we can go back and revisit that and lay out a funding profile that would do that.

Those aren't the constraints and that is not what the President has certified to.

The point I am trying to make is as a manager those are the conditions that have been put forward. That is what we have been managing the program to.

Senator WARNER. Senator Tower has a concern. It has come to his attention that there may be substantially less expensive ways of acquiring and maintaining an ALCM weapons loader system for the B–1B than simply scaling up the present B–52 ALCM loader system.

What plans do you have to explore the possibilities of realizing significant life-cycle savings through competitive design and procurement of this loader capability?

Dr. COOPER. Mr. Chairman, I believe the issue you are addressing there is some of the problems we have had early on with the current generation or new generation of munitions loader which is designated MHU–173.

That program is expensive. We bought approximately one-fourth of the units that we are going to need. Speaking from my own point of view, if there were a less expensive way to do that, that would accomplish that same task, we would be interested in looking at that.

In fact, I have asked for a review of that program which I think will probably be forthcoming in a month. We have a number of considerations. We have SAC operational needs, also logistical needs. We don't have a corporate Air Force position, however, on replacing——

Senator WARNER. You may amplify that for the record and we will continue to work with you on that.

Dr. COOPER. I will do that.

[The information follows:]

ALCM WEAPONS LOADER SYSTEMS

Initially, the operational rate for the MHU–173 was low and became a serious concern. However, problems with the MHU–173 have been reduced and reliability has significantly improved since ALCM Initial Operational Capability (IOC) at Griffiss AFB, NY in December 1982. This was accomplished by the formation of a "Tiger Team" that focused on proper supply provisioning procedures and more intense training for the load crews.

A program to competitively qualify an alternative trailer could not be completed before B–1B IOC; by then, two-thirds of the required MHU–173s will have been procured.

Finally, to load the B–1B, a special adapter to the MHU–173 is required. Rockwell has issued Requests for Proposals for the adapter and there appears to be fewer cost and schedule impacts/risks associated with the adapter than with a new alternative trailer.

In summary, although we have some concern about the reliability and maintainability of the MHU–173 over the long haul, we have no evidence which compels us to terminate production of the MHU–173 at this time. Funding a test of an alternative trailer at this late date does not appear to be in the best interest of the Air Force since a source of production funds is not available.

Senator WARNER. Given the assessment of Soviet air defenses that has prompted you to consider terminating at this time the ALCM–B production program, what conclusions should the committee draw concerning the penetrability of the GLCM and SLCM missiles as currently configured?

Dr. COOPER. Not to beg that question, in order to get into a detailed answer, we would have to go closed.

Many of those concerns were addressed on Monday. Let me simply say that the advanced cruise missile, when you compare it with the GLCM is more than just reduced observables. In the advanced cruise missiles, we are also looking at range enhancement, better accuracy, better overall performance.

I think in my view the enhanced range on the cruise missile is as important as some of the other aspects of it. That was one of the major concerns.

I feel awkward in commenting further on that in an open session.

Senator WARNER. We are at one of the junctures where I have to defend the system on the floor with other members of this committee. There is a circumstantial case out there that I have to rebut.

At this time I am not going to press you.

Dr. COOPER. I would like to make one comment.

Senator WARNER. But I want something in the record on this point that I can use in the open.

Dr. COOPER. I understand. We believe that the current generation cruise missile, the AGM–86B with the improvements that we plan to make to it will be a very effective weapon through the decade of the eighties.

The advanced cruise missile in our view represents more of a technological opportunity and something that was set in motion several years ago, as opposed to an absolute urgent need right now.

We think that the current generation cruise missile will fulfill its mission for years to come. As we get into the decade of the nineties and, as the air defenses thicken over there, we do think at some point in time we will need to have an advanced cruise missile.

I will be happy to try to amplify to the degree I can.

[The information follows:]

PENETRABILITY OF THE GLCM AND SLCM MISSILES

[Deleted.]

Senator WARNER. There could be a lively debate and we will need some material.

Dr. COOPER. Mr. Chairman, that is all we have.

Senator WARNER. That is fine.

We will submit some questions for the record.

[Questions with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN W. WARNER

ASSESSMENT OF CAUSES OF ACCIDENTS

Senator WARNER. The committee is, of course, keenly concerned about the recent spate of crashes involving B–52 aircraft. Would you provide us with your assessment of the causes of these accidents, to the extent they have been identified?

Dr. COOPER. As you may know, the mishap investigating board's findings are not releasable outside Air Fore safety channels. This information is gathered purely for mishap prevention purposes, and its release would have a stifling effect on the free and frank expression of ideas, opinions and recommendations by Air Force officials.

AGE OF AIRCRAFT (B–52)

Senator WARNER. Is there any reason to believe that the age of the aircraft is beginning to produce critical reliability hazards endangering their crews and those charged with maintaining these systems?

Dr. COOPER. Although the age of the B–52 force is a matter of concern, there is no reason to suspect that aircrews or maintenance personnel are being exposed to critical reliability hazards. Although age does affect the level of effort required to maintain the B–52 fleet, it does not reduce the airworthiness of an individual aircraft when that aircraft is scheduled to fly. The Air Force invests hundreds of manhours to prepare an aircraft for each flight. The individual aircrew, itself, is the final judge as to whether or not an airplane should be flown. We neither expect nor allow our aircrews to fly unsafe aircraft. Despite its age the B–52's accident rate is one of the lowest in the Air Force.

IMPACT OF DECISION BY CONGRESS

Senator WARNER. Strictly viewed from the standpoint of program management, what impact do you believe the decision by the Congress to constrain rate production of the B–1B to three per month would have upon the overall program?

Dr. COOPER/General THURMAN. If the B–1B were constrained to a production rate of three per month, the program would require at least six additional months to complete the production of 100 B–1B aircraft. This slip will cause the program to breach the budget ceiling of $20.5 billion (fiscal year 1981 dollars). In addition, program management problems could be generated if this option were pursued at this stage in the program.

For example, the contractors may be less cooperative in future contract negotiations. Currently, the contractors are willing to assume more risk than normal, because they are very aware of the program's budget ceiling as well as the unique cooperation between the legislative and executive branches of government to see that the B–1B budget and schedule are met.

Major changes in the program, such as restructuring of the production rate, would certainly impact that confidence and could result in prolonged and, from the Government's viewpoint, less favorable negotiations.

MONEY ELIMINATED FROM FISCAL YEAR 1984 REQUEST

Senator WARNER. How much money could be eliminated from the fiscal year 1984 request if multiyear procurement at the four-aircraft per month rate were to be disallowed by the Congress and a maximum rate of three produced per month were to be stipulated?

Dr. COOPER/GENERAL THURMAN. It should be noted, that by saving a few hundred millions in the B–1B fiscal year 1984 budget, the overall cost of the program will be increased substantially, by several billions of dollars, as a result. This action would of course result in a violation of the $20.5B (fiscal year 1981 dollars) baseline cost estimate for the B–1B program as certified to the Congress by the President.

Both an annual and a multiyear procurement funding profile for a 100 B–1B aircraft program were submitted with the Defense Department Multiyear Procurement Notifications to Congress. The annual program was based upon an equivalent (equal quantities) program, but it did not correspond to any official budget estimate funding profile. The multiyear profile exceeds the annual procurement profile in fiscal year 1984 by $438.7 million (TY dollars).

Should the Congress stipulate a maximum production rate of three aircraft per month vice the planned four, the fiscal year 1984 request could be reduced by approximately $100 million through the elimination of the tooling necessary to support the four per month production rate.

In addition, some funds would be eliminated from the advance procurement account due to the reduced buys in fiscal year 1985 and fiscal year 1986. A precise value for this action cannot be estimated without a firm production buildup schedule.

CSRL

Senator WARNER. What is your current attitude with respect to the Common Strategic Rotary Launcher (CSRL)? Does it still appear that a common launcher is the best, most cost-effective means of obtaining the rotary launcher capability needed for the B–52H, B–1B and ATB? When do you expect that system to be defined and a go-or-no-go decision made on this program?

Dr. COOPER/General THURMAN. The CSRL will provide internal cruise missile capability for the B–52H and B–1B and a multi-purpose launcher for the ATB. Preliminary Air Force estimates identify an approximate $150–180 million life cycle cost advantage in developing and procuring CSRL versus unique ALCM launchers. Definitive CSRL costs affirming the advantage will be known following the receipt of "Best and Final Offers" from the competing contractors.

Once the firm cost and schedule proposals are in hand and the source selection process is completed on 15 June 1983, the Air Force will make specific decisions on the number and type of launchers to procure.

EFFECT ON ATB PROGRAM IF B–1 SLIPPED

Senator WARNER. What, in your view, if the Congress were to decide—because of budgetary pressures—to stretch the B–1B procurement program, would be the effect on the level of effort and production schedule of the Advanced Technology Bomber (ATB)? Would it be your recommendation that the ATB program be slipped as a consequence?

Dr. COOPER. Acquiring the B–1B while continuing to pursue the ATB is clearly the most prudent approach to revitalizing our bomber forces. This approach enables the fielding of the necessary additional forces required during a period when the United States must depend heavily on bombers, while the proper steps to strengthen our landbased missiles are taken.

Should budgetary pressures cause Congress to stretch procurement of the B–1B, the bomber modernization program would certainly be adversely affected both in terms of total cost and operational effectiveness. However, the Air Force would make every effort to minimize the overall impact through the most efficient distribution of available funds. Any slippage in the anticipated ATB program schedule would only further delay our modernization efforts.

MODIFIED ALCM–B PRODUCTION PROGRAM

Senator WARNER. What production rate would you recommend be sustained in the ALCM–B line for fiscal year 1984? What is the dollar value associated with that rate of production? What impact is there on unit costs due to the lower rate of production?

Dr. COOPER. The Air Force plans for a production rate of 20 missiles per month. Total production cost of the 240 missiles in fiscal year 1984 is estimated to be approximately $464 million, which is an increase of $360 million to the current fiscal year 1984 President's Budget. This is a (Category IV) planning estimate based upon an analysis of selected key cost elements. The fiscal year 1984 unit cost of the ALCM will increase slightly over the fiscal year 1983 unit cost due to the lower rate of production. However, total program acquisition unit cost, as compared to the current fiscal year 1984 President's Budget, will decrease slightly. This additional buy will ensure an orderly transition from the ALCM–B to the Advanced Cruise Missile program.

IMPLICATIONS FOR U.S. INDUSTRY

Senator WARNER. What do you believe are the implications for U.S. industry as it looks at the reliability of the Department of Defense as a customer in light of the Department's behavior with respect to the ALCM–B production program?

Dr. COOPER. As requirements change, the Air Force must retain the flexibility to take advantage of technological opportunities offered by programs such as the Advanced Cruise Missile (ACM). To enhance the long-term survivability of the Air Launched Cruise Missile (ALCM) force, the Air Force identified the need to develop a next generation ALCM. As major programs are initiated industry is given the opportunity to compete for these programs. The Boeing Company was a competitor for the ACM program.

RESPOND TO CHARGE

Senator WARNER. How do you respond to the charge that Boeing has been treated in a cavalier way after it made an investment of some $40 million in plant facility and equipment for ALCM–B production?

Dr. COOPER. The Air Force must be flexible and be able to respond to changing needs. The Advanced Cruise Missile (ACM) offers the Air Force an opportunity to take advantage of new technologies and provide a more capable cruise missile. The Boeing Company did compete in the ACM competition; however, the Secretary of the Air Force, as the source selection authority, selected General Dynamics as the prime contractor.

BOEING PROPOSAL TO UPGRADE ALCM–B

Senator WARNER. What is your assessment of the Boeing proposal to improve the penetrativity of the ALCM–B? Do the steps they have proposed appear capable of measurably improving ALCM performance? Is that a preferable approach to take, given the investment we have made in ALCM–B production, rather than proceeding with an advanced cruise missile?

Dr. DELAUER/Colonel KIMINSKI. The Air Force has and is continuing to examine improvements for the ALCM–B to sustain its effectiveness against future defenses. While several of these improvements appear to provide cost-effective enhancements, they do not provide the degree of improvement offered by an Advanced Cruise Missile (ACM). The mixed force of ALCM–Bs and ACMs will significantly improve the long term effectiveness of our air breathing force.

POSSIBILITIES FOR COST REDUCTION

Senator WARNER. What, in your judgment, are the possibilities for realizing substantial cost-savings in the B–1B production program through manufacturing technology innovations?

General THURMAN. The B–1B baseline program was built around several Manufacturing Technology (MANTECH) projects developed during the original B–1A program. Examples of these projects include: numerical control machines, super plastic forming, diffusion bonding, laser drilling, and composite materials manufacturing techniques.

Mantech projects are most beneficial when initiated before production. Since we are already well into the B–1B production program, the possibility for additional Mantech savings are slight. However, in a related area of activity, the B–1B program is pursuing an aggressive technology modernization program that will reduce costs in this program as well as improve our overall industrial base.

QUESTIONS SUBMITTED BY SENATOR STROM THURMOND

B–1B PENETRATION BEYOND YEAR 2000

Senator THURMOND. General Thurman, the Defense Intelligence Agency presented some rather unsettling evidence of Soviet preparation of sophisticated air defense weapons systems. Can you assure to Congress that the B–1B will be capable of penetrating these defenses beyond the year 2000?

General THURMAN. For at least two decades, the Air Force has had a formal review process established to address quantitative and qualitative threat changes. That the Soviets are developing more sophisticated air defense weapons systems comes as no surprise to us. In fact, Soviet developments are tracking closely and in some cases are below our projections.

To counter U.S. low altitude, high speed, mass penetration tactics, low observables design, and adaptive electronic counter-measures, the Soviets had to develop [deleted].

The United States anticipated that Soviet move by several years and, in the early to mid-1970s, [deleted]. But, the B–1B defensive suite's modular architecture can readily accommodate deletions, tradeoffs and additions should currently unforeseen threat developments surface as the year 2000 approaches.

Senator THURMOND. Dr. Cooper, would you explain for the record the need for a penetrating bomber in this era of cruise missile technology?

I think that point is often lost in the debate over the need for manned bombers.

Dr. COOPER. AF and DOD analyses have shown that the most effective air breathing force is a mixed force of penetrating bombers and cruise missiles. A force of cruise missiles only would allow the Soviet defensive planner to optimize his forces against a single threat. The proper mix of cruise missiles and penetrating bombers compels the Soviet Union to divert funds from offensive to defensive forces. The penetrating bomber can conduct damage assessment strikes against fixed targets, a capability which precludes unnecessary expenditure of nuclear weapons and reduces collateral damage. With many of the Soviet ground forces and ballistic missiles becoming highly mobile, the penetrating bomber compels the Soviet Union to divert funds from offensive to defensive forces.

CAUSE OF B–52 CRASH

Senator THURMOND. Dr. Cooper, I understand that we lost a B–52 in Nevada several days ago. Is there any evidence about the cause of the crash?

Dr. COOPER. The investigating board has not yet concluded its investigation of the accident. As I am sure you know, however, the board's findings are not releasable outside Air Force safety channels.

DETERRENT VALUE FOR MONEY SPENT

Senator THURMOND. Dr. Cooper, I am sure you are aware of the budget constraints that we must operate under this year and that we must get the maximum amount for our defense dollar. In your opinion, which strategic system, B–1 or MX, offers us the most deterrent value for the money expended?

Dr. COOPER. The President has repeatedly emphasized that our national security requires modernization of our strategic deterrent, putting an end to the relative decline and neglect of U.S. strategic capabilities. The program which has been proposed will not only determine, to a large extent, U.S. strategic capabilities into the next century, but it also will increase Soviet incentives to negotiate genuine arms reductions. The program to achieve these ends must be considered as a coherent whole rather than piecemeal if the U.S. is to realize a more secure and stable deterrent force against the Soviets than exists today.

JT3D ENGINES

Senator THURMOND. Dr. Cooper, as you know, the Congress in the last couple of years has provided funds for modifying Reserve Force KC–135s with JT3D engines. Although these engines are not as capable as the CFM56 engines, they are far less costly than the CFM56s. The units which have received these JT3D engines are most enthusiastic about their performance. Not only are these aircraft more capable and better able to carry out their mission, but they also are very pleased with the noise reduction they have achieved. What would be the cost in 1984 of completing the modification with JT3D engines of all the Guard and Reserve units (excluding those that are collocated with active Air Force units)?

Dr. COOPER. The cost to complete the 32 non-collocated Air National Guard KC–135's in fiscal year 1984 with JT3D engines would be $165 million. All three Reserve KC–135 units are collocated with an active Air Force unit.

QUESTION SUBMITTED BY SENATOR JOHN C. STENNIS

COMPLETING MODIFICATION

Senator STENNIS. Dr. Cooper, as you know, the Congress in the last couple of years has provided funds for modifying Reserve Force KC–135s with JT3D engines. Although these engines are not as capable as the CFM56 engines, they are far less costly than the CFM56s. The units which have received these JT3D engines are most enthusiastic about their performance. Not only are these aircraft more capable and better able to carry out their mission, but they also are very pleased with the noise reduction they have achieved. What would be the cost in 1984 of completing the modification with JT3D engines of all the Guard and Reserve units (excluding those that are collocated with active Air Force units)?

Dr. COOPER. The cost to complete the 32 non-collocated Air National Guard KC–135's in fiscal year 1984 with JT3D engines would be $165 million. All three Reserve KC–135 units are collocated with an active Air Force unit.

QUESTIONS SUBMITTED BY SENATOR J. JAMES EXON

LENGTH OF EFFECTIVENESS

Senator EXON. How long will the B–52H with the ALQ–172 avionics be effective as a penetrating bomber?

Dr. COOPER. The Soviet defensive threat in the form of airborne interceptors and surface-to-air missile systems constantly undergoes improvements in numbers and quality. The ALQ–172 Countermeasures System planned for installation on B–52H aircraft introduces state of the art technology to counter the existing and predicted threat.

[Deleted.] As the B–1B becomes operational, the B–52H will transition to a standoff role carrying both internal and external cruise missiles.

FB–111 AS PENETRATING BOMBER

Senator EXON. How long will the FB–111 be effective as a penetrating bomber? Will it be receiving any of the B–52H modifications which would assist in this

regard? What is the operational life of the FB–111? Will it be given other missions when it can no longer penetrate?

Dr. COOPER. There is no reason to believe that the FB–111 will become ineffective as a penetrating bomber anytime in the near future. Its relatively small size, speed, agility and terrain following capability add significantly to its effectiveness. B–52 modifications, as such, are not applicable to the FB–111. However, the FB–111 does get updates to its Electronics Countermeasures set to keep pace with the threat. In addition, we have just initiated a modernization program to improve accuracy and reliability of the offensive avionics. At the current utilization rate, we expect the operational life of the FB–111 to extend beyond 2010. Current plans call for transfer of the FB–111s from the Strategic Air Command to the Tactical Air Forces as the Advanced Technology Bomber is deployed.

QUESTIONS SUBMITTED BY SENATOR CARL LEVIN

FIRM FIXED PRICE CONTRACTS

Senator LEVIN. Dr. Cooper, would you be willing to require that the four associate contractors on the B–1B agree to firm fixed price contracts (which would hold to the $20.5 billion) in order to get multiyear procurement funding?

Dr. COOPER. The Air Force's request for proposal for B–1B multiyear procurement called for fixed price incentive firm target contracts. General Electric did propose a firm fixed price (FFP) contract because their contract ceilings were already within the FFP range. We do not anticipate pursuing FFP contracts with the other associate contractors because they would be forced to inflate their negotiating positions substantially to protect their corporate interests.

We believe that the costs associated with the production of the B–1B are well understood and manageable. Therefore, the use of fixed price incentive firm target contracts will provide the contractors with a significant incentive to achieve program costs under target and thus result in significant savings to the government.

ATB IOC

Senator LEVIN. There have been reports in the newspapers that the ATB IOC has slipped drastically. Does last year's advertised IOC remain the same this year?

General WELCH/Dr. COOPER. There has been no slip in the ATB IOC. Recent newspaper reports are inaccurate.

ATB PROGRAM

Senator LEVIN. Is the ATB program funded sufficiently to maintain the IOC advertised last year? Is the AF or DOD trying to reprogram any money away from STEALTH programs for other purposes? Was the ATB program office's request for fiscal years 1984–88 funding to the AF and DOD more or less than what was eventually included in the fiscal year 1984 budget request to Congress?

General WELCH/Dr. COOPER. Details of the ATB program are specially controlled under "Special Access Required" procedures. Procedures have been developed to provide this material through the committee staff.

B–1B VERSUS ATB RCS'S

Senator LEVIN. How do the RCS's of the B–1B and the ATB compare, and couid a "Stealthized" B–1 be made with an RCS comparable to the ATB, or are the dimensions/configuration of the B–1 such that its RCS cannot be made comparable to the ATB?

General WELCH/Dr. COOPER. The B–1B has a conventional aircraft design. It will achieve the reduced radar cross section (RCS) [deleted].

FUTURE BOMBERS

Senator LEVIN. Three years ago, Congress ordered that whatever bombers the Executive Branch developed for the future should be capable of performing all

the major missions given to bombers: Nuclear penetration, conventional bombing, cruise missile carrying/launch.

Both the B–1B and the ATB bombers will be able to, and were designed to, perform these missions, will they not?

Dr. COOPER. Yes. All our future bombers are capable of performing across the entire spectrum of conflict.

B–1B VERSUS ATB CAPABILITIES

Senator LEVIN. The difference between the B–1B and the ATB bomber in their respective capabilities to carry out all 3 of these missions is insignificant, aren't they? Please describe what degree of capability each has relative to each other in all 3 roles.

Dr. COOPER. We cannot describe the Advanced Technology Bomber's military capabilities in this forum, for that material is classified, special access required. Procedures have been developed to provide that material through the Committee Staff.

The B–1B, on the other hand, is a tremendously capable aircraft because of its flexibility. Comparisons with the B–52 may highlight the magnitude of the improvement we will see when the B–1B is deployed compared to our current force structure.

	B–1B	B–52 G/H
Penetration speeds	0.85 Mach	0.53–0.55 Mach.
Range	Intercontinental	Intercontinental.
Low altitude tactics	Automatic terrain following	Manual terrain avoidance.
Internal weapons load:		
B61/B83	24	8.
Short-range attack missile	24	8.
Cruise missile	8	8.
MK–82 (500-lb. bomb)	84	27.
Radar cross-section [1]	1/100	1.
Electronic countermeasures [2]	Yes	Yes.

[1] As a fraction of the B–52's frontal radar cross section.
[2] The B–1B's AN/ALQ–161A is a fully automatic, programable, time managed, system which incorporates the latest state-of-the-art technology optimized for the small B–1B signatures.

ATB BETTER PENETRATION CAPABILITIES

Senator LEVIN. The ATB bomber will have better penetration capabilities, and thus better survivability and increased chance of success of delivering its weapons on target, than the B–1B in both the nuclear penetration and conventional bombing roles, won't it?

Dr. COOPER. The B–1B will embody a combination of techniques to reduce its radar cross section to a level one-tenth that of the original B–1A, and one-hundredth that of the B–52. It will also include the latest developments in electronic countermeasures technology and offensive avionics systems.

These developments, in conjunction with its high speed and low level penetration capabilities, will provide high confidence that the B–1B will be able to penetrate Soviet defenses well into the 1990s and perform as an effective cruise missile carrier and conventional bomber well into the next century and throughout its expected 30 years of service life.

The techniques associated with the ATB are classified Special Access, and any comparisons of its techniques and capabilities with that of the B–1B are similarly classified.

PROBABILITY OF SUCCESS

Senator LEVIN. As Soviet air defenses improve—more look down/shoot down—radar equipment fighters and fighters able to defend Soviet airspace farther and farther away from the Soviet homeland, we expect some of our bomber forces to "stand-off" to launch cruise missiles. The vastly reduced radar cross section of the ATB bomber compared to the B–1B will make it less susceptible to detection/interception by these improved air defenses, even in the cruise missile carrying role, will it not? Thus, ATB will have a higher probability of success of completing this mission than does the B–1B, also, won't it?

Dr. COOPER. At very great expense, the Soviets could field very long range fighters and employ them farther from the homeland. For this reason, the advanced cruise missile, with its long range, was added as a hedge to such defensive actions. Therefore, the B–1B's cruise missile role is not diminished and while the ATB can be used to carry cruise missiles, it is not required for that role and can be more effective as a penetrator.

MORE EFFECTIVE FORCES FOR ABOUT SAME MONEY

Senator LEVIN. If the radar cross section of the ATB is much smaller than the B–1B and so small that it won't need to stand-off, if we bought twice as many ATB as a mixed Stealth/B–1B program wouldn't we have a more effective force for about the same money?

Dr. COOPER. It is important to note that the cost of the ATB only program and of the combined program is essentially the same (given the degree of accuracy in any estimating technique). The combined program, however, is much more effective in maintaining the deterrence of the manned bomber force. It also provides significant added capabilities in this decade which the ATB only program does not.

The combined program offers both near and far term modernization that will force the Soviets to improve their air defense program starting now, and continuing throughout the rest of the century. The heavy investment this will require will provide the U.S. with significant leverage and restrict the Soviet's ability to upgrade their offensive forces. [Deleted.] Finally, the combined program allows us the option of deciding to buy more or less of either the B–1B or ATB at mid-decade depending on the progress made and the cost of each program. This competitive posture is extremely important in controlling costs and exists only in the combined program.

PRODUCTION OF B–1B'S

Senator LEVIN. General Thurman, in responding to Chairman Warner about the extreme drop-off in the M–1B production rate in the last year of its program, you said that was true, "should it (B–1B) be terminated." General, does the AF have plans to produce more than 100 B–1Bs? Is it even contemplating that in any way, shape or form? If so, how many more B–1Bs does it intend to buy and at what additional cost? Why did you say "should it be terminated," if the ATB bomber program is on schedule for an early 1990's IOC?

Dr. COOPER. At this time, we are not working any efforts other than the certified B–1B program which will produce and deploy 100 aircraft. However, it should be noted that the combined B–1B/ATB program allows us the option of deciding to buy more or less of either the B–1B or ATB at mid-decade depending on the progress made, estimated mission effectiveness and the cots of each program.

This competitive posture is extremely important in controlling costs and exists only in a combined program such as this.

Acquiring the B–1B while pursuing the ATB is the most prudent approach for modernizing our bomber forces. In addition, the combined force of B–1Bs, ATBs and cruise missiles will place maximum stress on Soviet air defenses and provide the United States with significant leverage in our long-term strategic competition with the Soviets.

RETIREMENT OF B–52'S

Senator LEVIN. Last year, the Defense Secretary's Posture statement made very negative remarks about our current bomber force and its declining utility in the near future:

"Our aging B–52s, which incorporate 1950s technology, are increasingly less able to adapt to new operational environments and are increasingly more difficult and expensive to maintain. . . . Our bomber modernization program will enable us to plan for the retirement of a large part of the current force. We propose to phase out . . . some B–52Gs in the late 1980s, and FB–111As in the early 1990s. We expect to retain our later model B–52s as standoff cruise missile carriers into the 1990s."

This year, the statement is much different:

"We expect our B–52Gs to serve effectively into the next decade"—either as cruise missile carriers or conventional bombers. Retirement of B–52Gs would not even begin until sometime "over the next decade."

"Finally, we foresee a very long operational life for our B–52Hs, the latest B–52 model, as cruise missile carriers *well* into the 1990s." (emphasis added)

And now, instead of retiring the FB–111As, they would be "transferred to the tactical inventory as the ATB is deployed."

What has happened to change the Air Force's plans about retiring these aircraft when it initially said it would? Has the Air Force discovered suddenly that these aircraft are more useful than they were just a year ago? Now you are delaying retirement of any B–52Gs from the 1980s to the 1990s, the FB–111As which were going to be retired now will be flown on tactical combat missions, and the B–52Hs will be useful now "well" into the 1990s.

General WELCH. Plans to retain the B–52H as a cruise missile carrier well into the 1990s have been a constant and important element of our bomber force modernization program. Our plans for the B–52Gs equipped for cruise missile carriage have been less certain. Whether these aircraft are retained into the 1990s will depend on the extent to which our overall strategic force and especially two bomber modernization programs are realized, as well as the arms control requirement then in effect.

Phaseout of FB–111s from strategic missions in the 1990s has also been a constant element of our plans.

A/C STILL CAPABLE

Senator LEVIN. Are you now admitting that these allegedly "aging" aircraft still do have some very impressive strategic nuclear capabilities and will do so for many years into the next decade?

General WELCH. The Air Force has not changed its plans about retiring the B–52s. When the President's two bomber program was briefed to Congress in the summer of 1981, the Air Force realized it had proposed retiring B–52 force too early. The B–52s will remain viable as cruise missile carriers (CMC) into the 1990s and the Air Force needs them as CMCs until then. The Air Force and DOD have continually restated this requirement during the fiscal years 1983 and 1984 budget cycles.

YEARS BETWEEN DEPLOYMENT DATES

Senator LEVIN. On the other hand, DOD states that it does not expect the B–52s will remain effective penetrators of Soviet air defenses until the ATB is deployed and the "lack of an effective penetrating bomber in the late 1980s would constitute an unacceptable deficiency in our strategic forces, since this would permit the Soviet Union to focus its air defense efforts solely on the ALCM force and it would severely limit our ability to attack moveable military targets critical to Soviet wartime objectives."

Is it not true that only a very few years exist between the deployment date of the ATB/Stealth bomber and fiscal year 1988, when the last B–1Bs are planned for deployment?

General WELCH. The details of the ATB program are specially controlled under "Special Access Required" procedures. Procedures have been developed to provide this material through the committee staff.

GAP IN TIME

Senator LEVIN. Is it not true that this gap in time would have been even shorter if the Pentagon had not changed the Stealth ATB from 1989, which SecDef Weinberger said in public on October 5, 1981, before this Committee, to the "early 1990s" date now being used?

General WELCH. SecDef Weinberger's reference to 1989 was an error which was corrected. The "early 1990s" IOC has not changed. Details of the ATB are specially controlled under "Special Access Required" procedures. Procedures have been developed to provide this material through the committee staff.

THREAT OF PENETRATING STEALTH BOMBER

Senator LEVIN. Why do you think that the Soviets, knowing full well that our Stealth penetrating bomber would be deployed in the early 1990s, would "focus its air defense efforts solely on the ALCM force," as the SecDef Posture statement for fiscal year 1984 says. Wouldn't the threat of a penetrating Stealth bomber keep them occupied in diluting their air defense efforts for this short period of time between ATB deployment and the B–52's lack of penetration?

General WELCH. In the fiscal year 1984 SecDef Posture Statement, the reference to the Soviet ability to "focus its air defense efforts solely on the ALCM force" is addressing operational realities and not a shift in R&D priorities. The difficulty that the current B–52 aircraft encounters in penetrating Soviet air defenses in the late 1980's relegates this system to a stand-off role as an ALCM launch platform. As a consequence and without the B–1B aircraft, the Soviets would have the luxury of concentrating their present air defense systems almost entirely on the ALCM since it would be virtually the only US system penetrating the Soviet landmass. On the other hand, with the B–1B aircraft, the spectrum of US penetrating systems broadens and the Soviets are forced to defend against not only the ALCM, but the B–1B and SRAM as well. This is in addition to any dilution of Soviet air defense efforts (R&D) which might be attributed to US low-observables programs, e.g., ATB and ACM.

SHIFT OF SOVIET FOCUS

Senator LEVIN. Considering the long time periods required to design, build and deploy air defenses, why would the Soviets be able to shift their focus in air defenses so rapidly as to obtain some meaningful advantage in the very short period of time we are discussing?

General WELCH. The intent of the fiscal year 1984 SecDef Posture Statement regarding this shift of focus was not meant to imply a dramatic reorientation of Soviet R&D priorities. Rather, the shift of Soviet focus in question relates to Soviet operational realities if B–1B aircraft were not deployed and ALCM became virtually the only U.S. penetrating system in the late 1980's. (See SA–195.)

B–52/FB–111 MODIFICATIONS

Senator LEVIN. Recently, SAC Commander, General Bennie Davis said: "SAC can perform its mission today. We maintain two very potent legs of the Triad. The 5–52 and FB–111 are still very effective bombers—we have not let them atrophy, but have implemented modifications that have kept pace with the expanding, improving Soviet threat." General Welch, do you agree with this statement?

General WELCH. Yes. The FB–111A has recently been modified with updated electronic countermeasures (ECM), weapon delivery computers, and nuclear weapon controls to accept the B–83 nuclear bomb. The aircraft is funded in FY84 to receive avionics modernization and in FY85 to receive additional ECM modifications to counter the latest Soviet threats. Our attention to the B–52 has been similar. Of the three remaining models, the D, G, and H, we have modernized and updated, in particular, the G and H in recent years. These aircraft are still effective platforms in their primary roles. The few remaining D models are scheduled to be retired this year and our modernization of the G and H continues with major efforts in ECM and Air Launched Cruise Missile (ALCM) carriage, and required reliability and maintainability improvements. These efforts are expected to preserve the military utility and operational flexibility of the B–52 force in the near term.

Senator WARNER. The hearing is adjourned.

[Whereupon, at 10:35 a.m., the subcommittee adjourned, subject to call of the Chair.]

DEPARTMENT OF DEFENSE AUTHORIZATION FOR APPROPRIATIONS FOR FISCAL YEAR 1983

MONDAY, MAY 2, 1983

U.S. SENATE,
SUBCOMMITTEE ON STRATEGIC AND
THEATER NUCLEAR FORCES,
COMMITTTEE ON ARMED SERVICES,
Washington, D.C.

SPACE DEFENSE

The subcommittee met in open session pursuant to notice, at 2:08 p.m., in room SR-222, Russell Senate Office Building, Senator John W. Warner (chairman) presiding.

Present: Senators Warner, Cohen, Quayle, Jackson, Stennis, and Bingaman.

Staff present: Frank J. Gaffney, Jr., George K. Johnson, Jr., and Patrick L. Renehan, professional staff members; Douglas R. Graham, research assistant; and Karen A. Love, staff assistant.

Also present: John Campbell, assistant to Senator Warner, and Jon Etherton, assistant to Senator Jepsen.

OPENING STATEMENT BY SENATOR JOHN W. WARNER, CHAIRMAN

Senator WARNER. The subcommittee resumes its work in connection with the authorization bill for 1984.

The subcommittee suspends for the moment its deliberation of the President's program for the land-based element of the U.S. deterrent forces. We do so in order to resume our review of the administration's plans for adding a new component to our defense posture—that is a space defense capability. The subcommittee held a hearing addressing this subject on March 23, 1983, the day of the President's announcement of his intention to pursue vigorously the technology necessary to acquire such a capability. The purpose of today's hearing is to insure that the subcommittee is fully informed about the administration's program in this area and acquainted with any changes to previous testimony and submitted requests that might be necessary as a result of the President's address.

Consistent with committee practice, we will open the hearing with a panel consisting of three of our distinguished colleagues who have introduced separate resolutions on the subject of space defense and related issues in recent weeks. Senator Malcolm Wallop of Wyoming has introduced Senate Resolution 100 relating to the building of weapons

for deployment in space. Senator William Armstrong of Colorado has introduced Senate Concurrent Resolution 23, which supports the President's call for a more humane and ethical strategic policy. And Senator Pressler of South Dakota has introduced Senate Resolution 43 concerning a negotiated ban on space weaponry.

Following the testimony of my respected colleagues, we will hear from witnesses representing various elements of the Department of Defense that are concerned with America's space defense policy and programs.

It is the Chair's intention that, following a period in open session, the subcommittee will convene in executive session, if necessary, to consider classified elements of these official witnesses' testimony.

A third panel will follow our executive session in which we will hear from three prominent nongovernmental witnesses who bring starkly different views to their testimony on the President's announced space defense plan. It is the Chair's hope that we will be able to hear from Lt. Gen. Daniel Graham, U.S. Army (Retired), Dr. Edward Teller, and Dr. Richard Garwin, by about 4 p.m.

Senator Wallop, we thank you for participating in our activities this afternoon and we look forward to your thoughtful testimony. You may proceed as you see fit.

STATEMENT OF HON. MALCOLM WALLOP, A U.S. SENATOR FROM THE STATE OF WYOMING

Senator WALLOP. Thank you very much, Mr. Chairman.

I appreciate being asked to speak on Senate Resolution 100 and the resolution that I have introduced along with Senator Laxalt and my colleague, Senator Armstrong and five other cosponsors.

The resolution agrees with the President's suggestion that henceforth the U.S. Government will seek to protect the American people against Soviet ballistic missiles, and asks the President to submit to the Congress the budgetary proposals necessary to turn that suggestion into a policy as quickly as possible.

I will briefly say why the country would benefit from bringing this resolution to a vote right away. Then I will speak at somewhat greater length about what we, in the Senate, should do to provide our country with protection against Soviet ballistic missiles.

Since the days of Robert MacNamara, the Pentagon has led the U.S. Government in the strategic policy of mutual assured destruction. This policy has proved to be politically disastrous. The American people have been told that, for the sake of peace, we must forever remain without any protection whatever against Soviet ballistic missiles and that if, for whatever reason, a major war is ever imposed upon us, all of us are sure to die.

Reasonable people have asked the consequent question: Why do we have to pay billions for our own Armed Forces if these forces will not be able to protect our lives?

The answer: The function of our strategic forces is to inflict terrible casualties on Russian society.

As anyone but Mr. MacNamara's supporters could have predicted, the American people, who greatly respected their men in uniform when

these were protectors, became less and less enthusiastic about them in their brave new roles of "avengers."

Look at contemporary antimilitary movements. At their core, you will find this assertion: Our military forces will not contribute to our safety. And buildup on our part can only raise the already superabundant likelihood of death and destruction for all.

Behind today's antimilitary movements lies the kernel of truth that contemporary strategic policy is both militarily senseless and immoral. Not surprisingly, that plea has not been well accepted, support for our own military activities has continued to decline, and the modernization of our strategic forces has lagged shamefully.

The military consequences of our adherence to MAD have been even worse than political ones. As everyone should know, the Soviets never accepted MAD. Their strategic forces have been built from the ground up, to attack our strategic forces—not to destroy us, but to disarm us.

They have provided for themselves an excellent air defense, a nationwide battle-management system for ABM work, a complex of ABM launchers at Moscow which covers most of European Russia, a rapidly deployable ABMX–3 and, according to the press, the dual-purpose SA–12 system for lightly attacked targets.

Thus, in October 1982, General Altunin could speak confidently about Soviet civil defense system's means for "liquidating the consequences of an enemy attack." No American could speak as General Altunin does—many Soviets do.

Of course, the Soviet defensive effort does not rest on its laurels. The Soviets are spending anywhere from 3 to 5 times as much as we are to develop directed energy weapons.

As a member of the Intelligence Committee, I invite Members of the Senate to come look at the classified evidence on the Soviet laser program. We are not sure about what is out there, but we can say openly that the effort going into that field is huge, and oriented toward early success.

All of this is to say that, as time passes the cost of a possible military confrontation continues to rise for the United States and continues to fall for the U.S.S.R.

Moreover, it is clear that, given the military programs of both nations, this trend will continue. This has become clearer as time has passed.

Well, how could this country undo the effects of the past 15 years' unanswered Soviet buildup? Unless we try to outbuild the Soviets in counterforce warheads—which no one proposes and I doubt we could do—we are left with but one possibility: To degrade the usefulness of the Soviet Union's superior missiles by ballistic missile defense.

Any serious plan for ballistic missile defense would involve several layers. But the first layer must be based in space, so that it can intercept attacking missiles where they are most vulnerable. The most efficient way to do this is by means of laser weapons.

That is why, 3 years ago, I came to this committee to ask for a commitment to integrate three ongoing technology programs—Alpha, Talon Gold, and Lode—into a single effort to build a space-based laser weapon.

Over the past 3 years, knowledge of the issue I have just described has spread. No well-informed person any longer denies that the three

technology programs I mentioned can be integrated into a laser weapon. However, the technical merits of this or that defense scheme are logically subordinate to the question, should we have a space-based defense at all?

This question was posed directly when Senators Hart and Kennedy proposed a resolution identical to the one proposed by Congressman Moakley in the House, saying that we should not build such weapons. Even before the President spoke, I thought that these colleagues had raised a fair question on which the Senate should vote.

The Congress has a responsibility to decide this basic question: Should the American people have the best protection against Soviet ballistic missiles which our ingenuity can devise, or shall we instead, again commit ourselves to remain undefended and rely for our safety on threats of vengeance?

In the past, the Congress and the executive branch, by taking any number of decisions, have effectively chosen not to protect the American people. But the Congress has never faced the issue squarely: Should we try to protect ourselves or not?

The President, my colleagues on the other side of the issue, and the sponsors of Senate Resolution 100, seem of one mind on this: The Congress should make its decision in an open, responsible way.

The means for our protection are important. But they are not the primary issue. Senators Hart and Kennedy agree that space-based antimissile weapons are not science fiction, that they are now being built.

Some have tried to sidetrack the issue by turning it into a pseudo-technical debate. Some claim that today's technology should not be integrated into space-based protection until we have developed a foolproof system. They then try to make sure that development will be slow and that every proposed system must meet impossible requirements. This is not honest.

Moreover, it is beside the point. If we decide it is good to protect ourselves, then it makes sense to build a variety of protective weapons as quickly as possible. If the first editions are not perfect, surely the subsequent ones will be better.

If, on the other hand, we decide it is not good to protect ourselves, then even near-perfect protective weapons would be a total waste of effort. The political question is logically prior to the technical ones. Our approach to technical matters depends on how the political question is decided.

There should be no doubt that enough technology is in hand for us to build space-based chemical lasers. I said this to the Armed Services Committee 3 years ago. At that time Mr. Robert Fossum, President Carter's Director of the Defense Advanced Research Projects Agency, wrote to Senator Culver, who then headed the R&D Subcommittee of the Armed Services, that an accelerated integrated program would result in a laser weapon in orbit by late 1987, with a 5-megawatt hydrogen fluoride laser, and a 4-meter main mirror.

Within a year technologists advanced the design which was supposed to yield 5 megawatts by developing new nozzles. With those nozzles that same device will yield 10 megawatts if built to its originally intended size.

As for mirrors, today Eastman Kodak, Perkin Elmer, and United Technologies feel very confident of their ability to deliver 10-meter mirrors. The pointing and tracking system, the most technically ambitious part of the weapon, has exceeded all performance requirements. Accuracies of 0.2 of a microradian have become routine in a variety of space programs. In short, there is every reason to believe that we could put a 10-megawatt, 10-meter chemical laser in orbit well before the end of this decade.

In March 1981 the Senate received a study by then Deputy Under Secretary for Defense, Seymour Zeiberg, that concluded that we could have a fleet of 10-meter lasers in orbit by 1994. There is no technical reason for us not to try to do it as soon as possible.

Let me also note that there are no honest managerial reasons either. Last year, as officials of the executive branch were telling the Congress that the space laser program could not possibly use more money, they were telling the aerospace companies that lack of funds was forcing them to de-scope the program.

Some have suggested that the ABM Treaty of 1982 prohibits us from putting laser weapons into space. I have read that treaty, and defy anyone to show me where it says any such thing. In fact, the treaty never mentions directed energy weapons at all, much less does the treaty define them in such a way as to make possible their limitations.

The first rule of international law is that whatever is not covered explicitly in a treaty is not covered at all. Some argue that because article I bans antiballistic missile weapons, currently consisting of launchers, missiles, and radars, and that because there is a comma before the word "currently," everything which could possibly serve to shoot down a missile on a warhead is banned forever. That cannot be so. If it were so, the rest of the treaty would be superfluous.

The absolutist interpretation of the treaty is also undercut by the Soviet Union's own proposal to the United States in August 1981 for a treaty to ban from space weapons not of mass destruction. Both Leonid Brezhnev and Tass said that such a treaty is necessary because no treaty "currently in force" bans such weapons.

I might add that delay Mr. Andropov reaffirmed that in his response to some of your future witnesses in here as reported in the Aerospace Daily of May 2, he said no such treaty restrictions presently exist. I would suggest, Mr. Chairman, if they do not think so, we had better not.

Suppose for a moment that the Soviet Union put a laser weapon in orbit. Would that be a violation of the ABM treaty? Immediately our Arms Control and Disarmament Agency would ask the Soviets whether the weapon were an ABM weapon. The Soviets would say no, it is an ASAT.

Then we would see the weapon tested against a missile. But the Soviets could continue to say it is primarily an ASAT. In this instance, there would be no more proof that a violation of the treaty had occurred than there has been in innumerable other cases involving both SALT I and SALT II.

Are dual purpose air-defense systems violations of SALT I? How can one prove that these systems are not intended primarily for air defense? One can't. Does encryption of missile telemetry violate SALT

II? How can one prove within the words of the treaty itself that the encryption impeded verification? I merely note that even these simple cases have proved too complex for us so far.

In sum, these treaties say what they say. They mean no more than they say.

An American laser weapon in orbit would certainly violate one view of the ABM treaty, the view held by those Americans who want this country to accept mutual assured destruction. But an American laser weapon would not be prohibited by the words of the treaty, by the Soviets' understanding of the treaty, or by the standards of compliance with arms control agreements which have evolved over the years.

How much protection can we build for ourselves and how soon? I have addressed that topic in previous letters to this committee and to individual members.

I will only mention here the figures I have cited: That a chemical laser weapon could be built in 5 years or so, and that a constellation of them could be in orbit in about 10 years at the cost of $5 billion for the first copy and a billion for each additional copy, that a system of 24 10-megawatt/10-meter stations could destroy a thousand Soviet ICBM's in 500 seconds, while at the same time protecting us from SLBM's and long-range bombers.

These figures came not from me, but from the aerospace industry. If this committee wants to find out how quickly the aerospace industry could build a fleet of space-based chemical laser stations, using the rules under which it operated at the time of the ballistic missile program 25 years ago, this committee has only to ask the right people to come, and to ask the right questions.

I do not mean to suggest, nor have I ever, that protection against Soviet ballistic missiles begins or ends with space-based chemical lasers. You will recall that each of the amendments I have presented since 1980 sought not only to provide money for the chemical laser triad, but also for systems integrated of that triad.

They also sought radically to increase funding for the shorter wavelength lasers which may or may not give us superior laser weapons in the future, but which are not ready for systems integration today.

In addition, I have cosponsored Senator Domenici's initiative to add funds for conventional ballistic missile defense. Indeed, I believe that both technology and commonsense are driving us toward dual-purpose radars and missiles, able to intercept both airplanes and a reasonable number of incoming re-entry vehicles.

The ground-based defense of lightly attacked targets is technically easy. There is no excuse for not undertaking it. No serious person could suggest that any defensive scheme should stand alone. Anyone who is serious about protecting the American people will support a variety of overlapping systems.

By the same token, I believe history shows unequivocally that when a nation is moving into a new technical field, it is best served by funding a variety of competitive approaches. When we did this in the late 1950's and early 1960's, we overcame a late start in the field of ballistic missiles.

Despite technical uncertainty far greater than we face today in the chemical laser field, we quickly produced Thors, Jupiters, Atlases,

Titans, and Polaris. These systems were imperfect, but quite good enough to keep the peace.

Then, in the late 1960's, we turned the development of strategic technology over to MacNamara's process and MacNamara's people. The result, the MX, will be at least 10 years behind its Soviet competition.

The MX is a superb argument for the proposition that the present process for bringing along strategic technology should be reformed. We should look back to a time when we overcame greater technological challenges more quickly and more cheaply.

Let me add that peace itself is at stake. For most of our history, our safety was assured by two oceans controlled by our Navy and Britain's. Today, primacy in space is contested. Who in this country would feel safe were Soviet laser weapons to dominate the oceans of space?

To sum up, I want to urge this committee to send Senate Resolution 100 to the floor, and to get both it, and the resolution which opposes it, to a vote. I think the debate and the vote would be good for the country.

I suggest that you call the people who are working in the laser field, that you ask them specifically neither to support nor oppose any program, but merely to lay before you what they could do if they were asked to develop directed energy weapons capable of shooting down Soviet missiles as quickly as possible.

We are all rightly concerned with public opinion with regard to our own military forces. We should all have learned by now that any attempt to cast or to explain our strategic forces in terms of mutual destruction is sure to fail for both moral and military reasons.

But why should anyone try to cast or explain our forces in these terms when we can provide real protection. I suggest that public opinion could receive no better tonic than a clear commitment from both the President and Congress that henceforth this Government's first priority will be to protect American lives.

MAD won't survive because it is immoral. You cannot argue it much longer, and why should you when you can provide real protection?

I thank you for the opportunity to address you. I ask that Senate Resolution 100 be inserted for the record.

[S. Res. 100 follows:]

[S. Res. 100, 98th Congress, 1st session]

RESOLUTION Relating to the building of weapons for deployment in space.

Whereas the first responsibility of any government is to ensure the physical safety of the population, and

Whereas under articles 13 and 48–58 of the Geneva Convention, our Government, like other signatory governments, has the obligation to protect our citizens against the effects of war, and

Whereas the United States Government does not now possess any means of defending the American people against attack by ballistic missiles, and

Whereas the President is correct that it would be "better to save lives than to avenge them", and that we should be working as hard as possible to render weapons of mass destruction "impotent and obsolete", and

Whereas various technologies hold out real hope that the United States Government could offer the American people substantial protection against ballistic missiles by deploying antiballistic missile devices in space and on the ground, and

Whereas it is reasonably clear that the Soviet Union has provided itself with offensive space weapons and is trying to provide for itself a space-based laser

weapon by means of which to defend itself against ballistic missiles: Now, therefore, be it

Resolved, That it is the sense of the Senate that the President expeditiously recommend to the Congress the budgetary steps necessary to protect the American people by building weapons for deployment in space, at the earliest possible date, with the capability of destroying ballistic missiles which might be launched against our country.

Senator WARNER. I thank my distinguished friend and colleague. I do have one or two questions.

May I inquire of the panel if there is any priority of timing that you have among yourselves? I would like to ask a question or two. Maybe it is preferable to hear from each of the witnesses first.

Senator WALLOP. Whatever the chairman desires.

Senator WARNER. Senator Armstrong?

STATEMENT OF HON. WILLIAM L. ARMSTRONG, A U.S. SENATOR FROM THE STATE OF COLORADO

Senator ARMSTRONG. I am also very happy to have a chance to appear before the committee.

When Demosthenes, the great statesman of Athens, was asked why the people of that ancient city failed to rally to oppose the dictatorship of Phillip of Macedon in 341 B.C., Demosthenes blamed the leaders. The people of Athens failed in their duty, he said, because the leaders had not only failed to inform but had, in effect, told the people what they wanted to hear, instead of what they needed to hear to assure their survival.

I don't know what is going to happen in response to the President's March 23 address, but I do believe that history will record that the President has given the people of the country in that message what they need to know for the survival of the country.

May I say, Mr. Chairman, I think that the Senator from Wyoming has performed an invaluable service in the statement he has just made. I know other members of the Senate, including particularly those on this committee, have done the same.

It is important, it is our task to set before the people of this country what they need to know for their survival, and in our system, through our regular democratic process, we shall make choices, we will make decisions.

I am impressed in the reading of military history that, over and over again, nations come to historical intersections and those nations which choose wisely survive and prosper and those who make errors of judgment frequently pay a bitter price for their failure to exercise good judgment.

King Phillip II, declined to change to the Mediterranean-style naval warfare and was swept from the Atlantic by the British and the Dutch, leading to the defeat of the Spanish Armada.

The conscious and the repeated, over decades, refusal of the Turks to adopt Western-style methods led to one military disaster after another and eventually to the dissolution of the empire in 1918.

Similarly Frederick the Great refused, declined, to emphasize artillery when other nations did so and despite the fact he commanded the most obedient and valiant troops of that time, perhaps any time in modern history, his military ambitions were thwarted.

On the other hand, Great Britain, at a crucial moment in that nation's history made a very wise decision to form a national bank in order to finance the expansion of their navy. It is my reading of history that that was the difference between their becoming a global seapower and outdistancing other nations, particularly France, that built better ships on a ship-for-ship basis, but did not have the national policy to support that seapower.

In our own century, the French sought to hide the Maginot line. America dallied while Japan prepared for war in the Far East. We have seen that these huge national decisions have great consequences.

It is my conviction that this is the import and the significance and the context in which the President's March 23 statement should be evaluated. Mr. Reagan proposes to execute a 180-degree shift in the strategic nuclear policy which the United States has followed for the past 20 years to move away from a policy which is based on our ability to kill Russian people and toward a policy predicated on our ability to defend people of this country. He seeks nothing less than to lift the "sword of Damocles" hanging over our heads for all the reasons that the Senator from Wyoming has pointed out.

Mr. Chairman, in the basement of this building in the congressional reading room, there is a volume entitled, "An Encyclopedia of Military History." It records the history of warfare from 3,500 years before Christ to the present time and in a page or two, it outlines every war and every major battle. It is a very, very long history. It is a lengthy document.

During the course of the years' chronicles in this volume, hundreds of nations and empires have risen and fallen. I am told that there is but one instance, only one recorded in this comprehensive history, in which a major nation has made it a matter of conscious national policy not to defend its own people—only one—there may be another. Someone may be able to suggest another.

I am told in that volume and elsewhere in recorded history there is only one instance in which an important nation has said we are not going to defend its own people. Of course, as Senator Wallop pointed out, that nation is the United States of America. This policy, this mutually assured destruction doctrine, with its eminently appropriate acronym MAD, has been the policy of our country for two decades.

In my prepared statement, I discuss some of the milestones on the road we have come down, and some of the reasons why this policy has been already shown to be completely flawed, particularly in light of the statement which Senator Wallop has made.

I would ask to submit my entire statement for the record.

I also would want you to know over and above the practical reasons—just the nuts-and-bolts reasons—of strategy and tactics that such a doctrine has been discredited, that there is an even more fundamental level, a serious moral objection to any policy which rests upon the idea of holding civilian populations hostage.

In my review, for us to say that the security of the United States rests upon our ability to kill Russian women and children is absolutely reprehensible. It is also impractical for reasons we have already covered and which we could go over at great length, but it seems to me we need to address this in moral terms as well by emphasizing strategical defense.

President Reagan has proposed an alternative to this immoral strategy that is logically sound and historically correct, an alternative which does not rely on the goodwill of the generals in the Kremlin to succeed and an alternative which is based on the concept of saving lives rather than taking them.

If we can create an effective ballistic missile defense, the people of the United States will no longer have to fear a nuclear holocaust. We can lift that fear from the lives of our people without hanging our security on the goodwill and humanitarianism of the leaders who are even now butchering innocent people from Afghanistan to Poland, nor on the promises of leaders who have repeatedly broken practically every important treaty promise that they have made.

In anticipation of objections which are sure to arrive, let me point out that an effective ballistic missile defense system need not be perfect in order to achieve a substantial reduction in danger. I think the Senator from Wyoming and others who will testify have addressed the technical issues. To some extent, in my prepared statement, I have already done so as well.

If we can create an effective missile defense system, we can also look to the day when we may withdraw from our own arsenal the weapons of mass destruction that have cast such a pall over the world.

If we could base our security on something more substantial than our ability to kill Russian civilians, we would not have to have such a large stockpile of such weapons. This would be, in my judgment, a positive step toward reducing the number of offensive weapons in the world without endangering our own security, perhaps the beginning of a process to remove these nightmare weapons on the face of the earth altogether.

I am assured by experts that it is both practical and affordable for the United States to deploy an effective ballistic missile defense system before the end of this century. It is my judgment that that is one of the most important, possibly the most important, task before the Senate at this time.

Mr. Chairman, I appreciate the opportunity to be here. I am looking forward, as I know the committee is, to the testimony of other witnesses. I ask that Senate Concurrent Resolution 23 be inserted for the record, as well as my complete prepared statement.

[S. Con. Res. 23 and the prepared statement of Senator Armstrong follow:]

[S. Con. Res. 23, 98th Congress, 1st session]

CONCURRENT RESOLUTION To support the President's call for a more humane and ethical strategies policy.

Whereas the United States should make every effort to remove the threat of nuclear war from the face of the Earth;

Whereas we believe that the human spirit must be capable of rising above dealing with other nations and human beings by threatening their existence;

Whereas it is the policy of the United States to save lives, rather than to avenge them;

Whereas the protection of people and their societies is a fundamental goal of the United States;

Whereas the President has called for the development of strategic defensive technologies that could destroy any potential adversary's ballisic missiles before they reach our soil or that of our allies and has called upon the American scientific community to develop the means to render nuclear weapons impotent and obsolete.

Whereas an American strategic policy including strategic defense will eventually provide greater strategic stability than a policy built solely around strategic retaliation; and

Whereas the President has called for the development of strategic defenses as an arms-control measure to eventually eliminate nuclear weapons altogether: Now, therefore, be it

Resolved by the Senate (the House of Representatives concurring), That the Congress—

(1) supports the President's call for a more humane and ethical strategic policy for the United States;

(2) supports the President's efforts to develop strategic defensive systems as a new policy of peace to reduce our present sole dependence on the threat of nuclear retaliation;

(3) commends the President for his courageous initiative to develop new arms-control policies and other measures, including those built on the deployment of strategic defensive systems, to eliminate the threat posed by nuclear weapons to all mankind; and

(4) supports the President's historic call for a national technological and scientific effort to develop means of rendering nuclear weapons impotent and obsolete.

PREPARED STATEMENT OF SENATOR ARMSTRONG, A U.S. SENATOR FROM THE STATE OF COLORADO

When Demosthenes, the great statesman of Athens, was asked why the people of that ancient city failed to rally to oppose the dictatorship of Phillip of Macedon in 341 B.C., Demosthenes blamed the leaders. The people of Athens failed in their duty, he said, because the leaders had not only failed to inform but had, in effect, told the people what they wanted to hear, instead of what they needed to hear to assure their survival.

Whatever may lie ahead for our nation, I believe history will record that President Reagan has told the people of America what they need to know, the hard facts of international life. In his address to the nation on the night of March 23rd, Mr. Reagan called for historic change in U.S. strategy and explained in clear, forceful terms the reasons for his proposal.

How we shall respond remains to be seen. But I am personally convinced that the fate of our nation depends upon our response; indeed, if I may borrow the title of Jonathan Schell's influential new book, upon our response to the President's initiative may well depend "The Fate of the Earth."

In reading military history, I am impressed that over and over again, nations have come to historical intersections; those nations which have chosen wisely have survived and prospered while those which have taken wrong turns have paid a bitter price for their errors of judgment.

The failure of King Phillip II to adapt to Mediterranean style naval warfare doomed Spanish efforts to compete in the Atlantic against the English and Dutch and contributed heavily to the historic defeat of the Spanish Armada.

The conscious and obstinate refusal of the Turks to adopt European methods of training led to one military disaster after another. Even subsequent efforts to modernize could not prevent defeats which culminate in dissolution of the Empire in 1918.

Similarly, the deliberate downplaying of artillery doomed the ambitions of Frederick the Great despite the legendary valor and obedience of his Prussian troops.

But the willingness to form a national bank to finance naval expansion permitted Britain to become a global seapower, far outdistancing rival nations including some whose warships were better designed than their British equivalents and whose governments aspired to naval parity or predominance.

In our own century, drastic strategic mistakes have repeatedly been the margin between safety and suffering, victory and defeat as the French sought to hide behind an impractical Maginot line, the British failed to mobilize against Hitler and America dallied while Japan prepared war in the Pacific.

That such decisions—of preparedness and strategy—are matters of life or death is the repetitious lesson of history. Therefore President Reagan's March 23rd message to the American people should be evaluated in such an historical perspective.

Mr. Reagan's proposal is to execute a 180 degree shift in the strategic nuclear policy which the United States has followed for the past twenty years . . . to move away from a policy based on our ability to kill the Russian people, and toward a policy based on our ability to protect our own homeland without threatening the Russian population. He seeks nothing less than to lift from above our heads the nuclear sword of Damocles. If he is successful in this noble endeavor, I believe President Reagan will one day be regarded as the greatest peacemaker of our century. He deserves our wholehearted admiration and our vigorous support.

Undoubtedly the Committee will be hearing much testimony of a scientific nature and properly so. But the basic issue of U.S. strategy hinges on issues of moral and political judgment which far transcend purely military or scientific considerations. It is upon these issues that I would like to briefly comment.

In the Congressional Reading Room in the basement of this building, Mr. Chairman, there is a volume entitled: "An Encyclopedia of Military History," compiled by R. E. and T. N. Dupuy. It records the history of warfare from 3,500 years before the birth of Christ to the present day, with a page or two devoted to each major battle or war. The volume is depressingly long, comprising nearly 1,500 pages. In nearly 5,500 years of human history, during which hundreds of empires and thousands of nations rose and fell, the Dupuys were able to find only a single instance—just one—of a nation which voluntarily abandoned the defense of its own people. That dubious distinction, Mr. Chairman, belongs to the United States. We acquired it in the mid-1960's when we unilaterally abandoned efforts to defend our homeland, and embraced the policy that has become known as Mutual Assured Destruction.

I don't believe that any military acronym is more on the mark than the one that was coined for the doctrine of Mutual Assured Destination, because if Mutual Assured Destruction isn't MADness, then nothing is. The MAD doctrine was based on false premises; was never accepted by the Soviets, and is fundamentally immoral.

The MAD theory is easier to describe than it is to defend. Essentially, it's a murder-suicide pact. The theory was that if both the United States and the Soviet Union possessed the power to destroy each other, but not each other's weapons, then neither would ever attack the other, because the end result would be the destruction of both.

The first false premise on which the MAD doctrine was based was the notion that the intercontinental ballistic missile, of the late 1960s vintage, was the ultimate weapon. The MADmen assumed there would be no further advances in military technology, at least none that would matter.

This was a most foolish assumption to make. The "Encyclopedia of Military History," to which I've already alluded, indicates that over the last five millenia there has been a rough balance in the relative preeminence of offensive and defensive systems, with the balance shifting every 60 to 70 years. More often than not, it was the defense that was in the ascendancy. The military balance has never ever been static, yet the MADmen assumed that time and technology would be frozen, if not for all of time, at least for the indefinite future, at where we were 15–20 years ago.

It was an assumption that was proven false within a few years after Secretary McNamara succeeded in making Mutual Assured Destruction official United States policy. The development of independently targetable warheads with Circular Errors Probable of 300 feet or less undermined an essential component of the MAD doctrine. With accurate MIRV's on ICBM's, it was at least theoretically possible for one nation to destroy the other's weapons under condition of surprise attack. Assured Destruction no longer would be Mutual.

As you know better than I, Mr. Chairman, this is what appears to have happened. By adhering to the MAD doctrine, we have assured our own destruction in the event of a general nuclear war, but not that of the Soviet Union. The Soviets are on the verge of achieving, if they haven't already, the ability, under conditions of first strike, to destroy virtually all of our ICBM's, virtually all of our strategic bombers, and those nuclear submarines that are in port at any given time. While still most unlikely, a nuclear Pearl Harbor is now a conceivable policy option for the generals in the Kremlin.

Another fundamental flaw of Mutual Assured Destruction is that it was never mutual. Soviet leaders, in both official statements for foreign consumption and in

their military journals, derided it from the beginning as both insane and immoral. As you know, Mr. Chairman, for the MAD doctrine to have any validity at all, it is necessary for the leaders of both the United States and the Soviet Union to reject nuclear war as an instrument of policy. We, of course, have done so. But the Soviet leaders never have. On the contrary, it is still Soviet doctrine that a military clash between the Communist world and the capitalist world is inevitable; that "weapons of mass destruction" will be used in that clash, and that the Soviets should initiate the use of "weapons of mass destruction" in order to make certain that the Socialist World will emerge triumphant.

I don't believe this is more rhetoric on the part of the Soviet leaders, Mr. Chairman. They've been putting their money where their mouths are. The Soviet strategic forces, unlike ours, are configured for an attack on our weapons, not for the mutual massacre of civilians called for in the MAD doctrine. While Secretary McNamara and his successors deliberately stripped America's air defenses so our civilians would be more vulnerable to Soviet nuclear weapons, the Soviets were spending hundreds of billions of rubles on air defense, ballistic missile defense, and civil defense. Last June 18 the Soviets tested, apparently successfully, the command and control systems that would be required to make a nuclear surprise attack work. It seems clear enough to me, Mr. Chairman, that the Soviet leaders don't accept the MAD doctrine and never will. MAD is not a pact at all, just a one-way ticket to oblivion for the United States if we continue to cling to this preposterous doctrine.

The practical reasons I have discussed are more than reason enough for us to abandon, once and for all, the doctrine of Mutual Assured Destruction, and to move in the direction that the President has pointed out for us. But there is for me an even more compelling reason:

The MAD doctrine is immoral. There is something macabre, and worse, in basing our security on our ability to murder Russian women and children. And it is even more reprehensible—if that's possible—to deliberately increase the exposure of our own people to nuclear destruction simply in order to fulfill the demands of an abstract, a historical, unproven and illogical theory. We pray that deterrence will not fail. But if deterrence fails, there is nothing to be gained by massacring ordinary Russian civilians, the vast majority of whom have suffered more from Communism, and who hate Communism more than we ever will. Americans across the political spectrum have been uncomfortable with our strategic nuclear policy for some time, and I think the MAD doctrine is the reason why. Immoral policy is rarely ever good policy.

By emphasizing strategic defense, President Reagan has pointed the way to a revised nuclear strategy that is logically sound and historically correct; that does not rely on the goodwill of the generals in the Kremlin to succeed, and which is based on the concept of saving lives, not destroying them.

If we can create an effective ballistic missile defense, the American people no longer need fear a nuclear holocaust. We can lift that fear from the lives of all of our people without relying for our security on the goodwill and humanitarianism of leaders who have butchered innocents from Afghanistan to Poland, or on the promises of totalitarian leaders who have never kept such promises in the past.

I should point out, in anticipation of objections which are sure to be raised, that an effective missile defense system need not be perfect in order to achieve a substantial reduction in danger.

Furthermore, if we can create an effective ballistic missile defense, we can then begin to withdraw from our own arsenal the weapons of mass destruction that have cast such a pall over the world. If we can base our security on something more substantial than our ability to kill Russian women and children, we need no longer stockpile such weapons. We could take a very positive step toward reducing the number of offensive weapons in the world without fear of endangering our own security, and perhaps begin the process that would remove these nightmare weapons from the face of the earth.

Experts assure me that it is both practicable and affordable for the United States to deploy an effective ballistic missile defense before the end of this century. I can think of no more worthy task than the one the President set before us on March 23rd. Let us get on with the task.

Senator WARNER. I thank the Senator from Colorado.
The Senator from South Dakota.

STATEMENT OF HON. LARRY PRESSLER, A U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Senator PRESSLER. Thank you, Mr. Chairman.

I shall summarize my statement in the interest of time.

I want to thank Senator Warner and members of the Strategic and Theater Nuclear Forces Subcommittee for the opportunity to appear here today.

Senator WARNER. Let me interrupt.

We have the time if you have the time. This subject is a very important element in U.S. strategic plans. I don't know that I agree with all of it at the moment, but I certainly will give it careful consideration. If you desire to take more time, please feel free.

Senator PRESSLER. This subcommittee has played an important role in examining the strategic implications of space weaponry. In this way its activities have paralleled those of the Senate Foreign Relations Committee on Arms Control, which I chair.

Let me note that the Arms Control Subcommittee has held two hearings on space arms control issues. A third hearing which will receive testimony from ACDA Director Kenneth Adelman and from Under Secretary of Defense Fred Ikle, has been scheduled for May 18.

The United States recently passed the quarter century mark in space exploration. In that time, space technology has made massive strides. This is true not only in the military area, but also in the areas of science and commerce.

Farming is vital for the economy of my home State of South Dakota. Weather satellites have had a very important role in increasing farm production and thereby improving the U.S. export picture. Satellites are assisting our efforts to find new sources of energy which should help the United States to reassert its independence in this field. Communications satellites not only help to command and control U.S. military forces worldwide—today, 70 percent of military communications are transmitted via satellites—but they have increased the efficiency of our business community.

There is every reason to believe that this 25-year technological trend will continue. But as I see it, it can only be sustained if we develop policies and management tools which will maximize these developments. Unfortunately, there are signs that as our technology has advanced, our policy and the structure for making policy have not kept pace.

We seem to be entering a space arms race before fully assessing whether such a race is in our interest, and whether a space arms race can be avoided. In another field, that of remote sensing satellites and weather satellites, we seem to be moving away from Government leadership in these activities well before the private section is ready to operate these programs in a cost-effective manner

Internationally, there are efforts by some of the developing states to politicize the process of allocating orbital space assignments. Using international organizations such as the International Telecommunications Union, these nations are blocking the application of new technologies as direct satellite broadcasting. We, in the United States, lack a coherent policy to meet this international challenge to our technological leadership.

In essence, we must begin to develop a coherent space policy that covers all the dimensions of the potential application of space technology: military, scientific, and commercial. I ask that an op. ed. article that summarizes my views on these issues be printed at the conclusion of this testimony.

In responding to the mandate of this hearing, my testimony will focus on the issue of space weaponry. At the outset, let me note that I have offered Senate Resolution 43, together with eight cosponsors. Senate Resolution 43 calls for a serious U.S. effort to resume negotiations that would seek to ban ASAT weapons as a first step to banning all weapons in space.

The reason that I have offered this resolution is a belief that a space arms race can present both grave strategic risks and extremely great costs—costs that U.S. taxpayers will have to bear.

Let me note, what this resolution proposes is that the United States give arms control a serious try. It does not say that such talks will succeed. That requires far more seriousness from the Soviet side than is evident to date. I will say more about this later.

First, let us look at the risks of a space arms race. The United States is highly dependent upon space systems for many of its military operations. In many instances, this dependence is far greater than for the Soviet Union. Often, while the Soviets have ground-based substitutes for these activities, the United States has no such substitutes. In part, this is the outcome of our geographic location. We must remember that most of our military commitments are overseas; whereas, the areas of interest to the Soviet Union are on its periphery. In a war in Europe, for instance, we may have to rely upon satellites while the Soviets can use landlines for communications.

The same is true for intelligence collection. Due to the open nature of our society, the Soviets can keep track of the most significant U.S. military developments through the newspaper and through hearings in Congress. But in keeping track of military developments in the closed Soviet society, satellites are often our only option.

Let me cite two examples: During the 1950's, Khrushchev was able to intimidate the United States with, first, a bomber gap and later a missile gap. We were able to call Khrushchev's bluff only after our first reconnaissance satellite gave the United States a true picture of Soviet strategic forces. During the hostage rescue attempt in Iran, communications to our commandos was dependent upon satellites. In future operations in the Third World, we will continue to rely on satellites.

As for cost, it is fair to say that the cost of space weaponry will be very high. Let me cite some examples, some of which were first given in DOD testimony to this subcommittee.

The U.S. ASAT, which is priced at $3.6 billion by the Air Force, was estimated to cost "tens of billions" by the GAO. In essence, this conventionally armed weapon may come to cost as much as the MX program. Before we are fully committed to this development, we should give the ASAT program the same scrutiny as we have given MX.

Let me note that once we start down the path toward space weapons, it may be impossible to put a halt to these developments. The farther

we move into space weapons, the more expensive it will become. The Air Force Space Command is already looking beyond the conventionally armed F–15 ASAT toward laser ASAT's, according to one report. Such a system will cost $50 billion, according to a DOD study.

As for ballistic missile defense—BMD—systems in space, the cost to taxpayers will be astronomical. Dr. Robert Cooper, the Director of DARPA, priced the conventionally armed High Frontier system at $200 to $300 billion, in testimony to this subcommittee last year. As for a more modest arrangement, involving about 100 space-based BMD platforms instead of High Frontier's 400-plus platforms, DOD has stated that it would cost $50 to $75 billion or more.

In terms of laser-based concept, such as that proposed by President Reagan in his March 23 speech, we must note that feasibility studies will not be completed until 1988. We should accelerate these feasibility studies.

Again, let me cite some estimates that have been previously presented to this subcommittee. For a limited laser BMD, the DOD has offered an estimate of $100 billion. For a BMD that would have a "damage denial" mission, DOD has estimated that it would cost $500 billion. This $500 billion system would be far from perfect. According to the Pentagon, it would suffer from significant "leakage"—meaning that a large number of warheads would get to their targets.

I mention these considerations of risk and cost for several reasons.

First, I believe that there is a great likelihood that the Soviets will keep pace with space weapons deployments. Indeed, they already have an ASAT weapon and we have none. In such a space arms race, we have more to lose because in peacetime and wartime we are more dependent upon satellites—for reconnaissance, command and control, and for early warning, among other functions. Moreover, since we have fewer satellites in space than the Soviet Union, it will be easier for them to neutralize our capabilities.

Second, in terms of cost, we will have great difficulty in financing these ever more costly space weapons systems. The cost of some of these equal the entire U.S. defense budget for any given year during the mid-1980's. We currently suffer from deficiencies in our existing Armed Forces—our aircraft lack sufficient spare parts and ammunition, for instance. Should we get involved in a space arms race, we will have an ever more difficult time in correcting these problems. The U.S. armed services may end up doing many things badly, rather than few things well. I see little military advantage in such a situation. And, the American taxpayer will likely have to pay greatly increased taxes.

There are some circumstances in which we should consider deploying space weapons. Clearly, if the Soviets insist on seeking to gain unilateral advantage in space, we will have to respond.

Moreover, unless the Soviets are willing to dismantle their ASAT under appropriate means of verification, we will have no choice but to deploy our F–15 ASAT. However, if we are to determine Soviet seriousness in arms control and sincerity in seeking to avoid an unbridled space arms race, we must first return to the negotiating table.

If arms control fails, it should not be for lack of American effort, but for lack of Soviet willingness to seriously negotiate. Since the American taxpayer will ultimately pay the price for a space arms race

and face the risks that it may cause. I believe that the public deserves that the arms control option be given a try.

In the meantime, we must continue to do research and basic development studies, if we are to keep pace with Soviet efforts in the space field. We cannot and must not be caught off guard. Indeed, even if we can conclude an agreement on ASAT's, it will be important to continue basic R&D, since R&D is difficult to verify. This concept of continuing R&D is incorporated in the ABM Treaty and it is a wise course to take in protecting against a Soviet technological breakthrough.

Senate Resolution 43, section C, takes the position that such R&D as is permitted under the ABM Treaty be permitted under any ASAT accord that we and the Soviets can achieve. I ask that Senate Resolution 43 be printed at the conclusion of my testimony.

If arms control in space is to succeed, a great deal of responsibility rests not only on this administration, but equally upon the Soviet leadership. All too often, the Soviets treat U.S. military developments as a threat to mankind while it views its own weapons programs as serving the interest of global security.

This is clearly the case for space weapons. As was mentioned, the Soviets have an operational ASAT and they have operated it for the past 15 years. In the most recent test of this weapon, the Soviets launched it in coordination with launches of sea- and land-based strategic missiles, an SS–20 missile, and operations involving an ABM interceptor.

I cannot see anything peaceful about a weapons system that is used in such a nuclear war-fighting scenario.

Let me note that last week Soviet leader Yuri Andropov, wrote to a sincere and concerned group of American scientists and strategic specialists to urge their support of a Soviet proposal to ban all weapons in space. Andropov's motive in addressing this group had little to do with arms control and a great deal to do with propaganda.

The Soviet proposal, which was presented to the U.N., has a loophole that is large enough to fire the Soviet ASAT through. Their proposal would ban weapons in space. This excludes coverage of their ASAT which is fired from the ground.

Moreover, under this proposal the Soviets would retain the right to interfere with space systems that they regard as involved in hostile activities. Moscow has already targeted the Space Shuttle for propaganda. Could ratification of the Soviet offer give the Soviets a right to target it with their ASAT? Finally, the Soviets have long objected to direct broadcast satellites; would this Soviet treaty allow them to attack broadcast satellites that failed to echo Moscow's tune?

The one-sided nature of the Soviet proposal makes it clear that it is not a serious basis for negotiations. Unless the Soviets change their position, it may be impossible to avoid the race into space armaments.

Clearly, any agreement must give equality of rights to both the United States and the Soviet Union. If they retain their ASAT, we will have to deploy our ASAT. The better option is to reverse developments to date, under stringent means of verification.

The more advanced we are in space weapons development, the more difficult it will be to verify space arms control accords. Moreover, un-

less we can develop verification for research and development activities, then we must pursue such activities to safeguard against a Soviet breakthrough. In this, let me note that I have supported funding basic research and development on laser systems in past years.

Finally, even if we can achieve a ban on space weapons, we will still have to spend some money on countermeasures. There are just too many risks in being totally unprepared.

Satellites with a maneuver capability can be loaded with a charge and then moved close to our satellites and detonated. But I believe that a latent ASAT capability is less effective as an ASAT than is an active ASAT capability. We must be prepared to deal with this less serious latent ASAT threat.

If we are to give arms control a try, we must do so now. We are running out of time as the space arms race speeds up. Should negotiations fail for reasons of Soviet intransigence, we will lose little. We will retain our space weapons programs and options.

Thank you, Mr. Chairman.

[Senate Resolution 43 and attachment to Senator Pressler's statement follow:]

[S. Res. 43, 98th Congress, 1st session]

RESOLUTION Expressing the sense of the Senate that the President of the United States invite the Soviet Union to negotiate a verifiable ban on antisatellite weapons as a first step toward prohibiting all space-based and space-directed weapons.

Whereas the United States depends upon satellites for preserving the peace through command and control of United States forces worldwide and through early warning of strategic attack, among other functions;

Whereas satellites are vital for verification of arms control agreements;

Whereas the safety of such important missions including those performed by the Space Shuttle would be comprised by the threat posed by killer satellites;

Whereas a space arms race would undermine strategic stability;

Whereas a military space race would add to the uncertainties faced by military planners and thereby complicate the task of designing an effective military force structure;

Whereas an arms race in space would be a drain on the American taxpayer and would undermine our ability to correct current deficiencies in our military posture;

Whereas the United States and other nations rely increasingly on space-based systems for weather forecasting, communications, natural resource exploration and other important commercial activities;

Whereas the maximum utilization of space technology for commerce and science is assured only under peaceful conditions;

Whereas the unregulated deployment of hazardous space systems, even if intended for nonweapons purposes, poses a serious danger to human life; and

Whereas the present pace of military space developments will soon reduce the prospects of avoiding the weaponization of outer space: Now, therefore, be it

Resolved, That it is the sense of the Senate that—

(a) the President should immediately prepare a proposal and invite the Soviet Union to negotiate a verfiable ban on the development, testing, production, and deployment of antisatellite weapons as a first step toward prohibiting all space-based and space-directed weaponry;

(b) these negotiations should also seek to restrict to the extent consistent with United States national interest the deployment of hazardous objects and materials, such as nuclear materials in outer space; and

(c) in pursuing agreement with the Union of Soviet Socialist Republics on antisatellite weapons, the President should agree to no provision that would in any manner restrict the development and operation of the Space Shuttle or impede legitimate activities permitted under the SALT I ABM Treaty.

[From the Christian Science Monitor, Apr. 19, 1983]

OPINION AND COMMENTARY

HEADING OFF BAD SPACE POLICIES

(By Larry Pressler)

Recent events highlight the public's growing interest in outer space issues. Last July 4, the Space Shuttle Columbia ended is test phase and entered the transport business. In January, a Soviet nuclear-powered satellite plummeted to earth, threatening populated areas. In February, President Reagan moved to sell two satellite systems to COMSAT, and in March he announced plans to develop laser weapons that could be deployed in space. The laser program would be a follow-on to the U.S. anti-satellite weapon which is soon to be tested and deployed.

Such programs have a major impact on the public. The move toward space weapons is an expensive proposition and it could be militarily destabilizing. The General Accounting Office believes that the U.S. ASAT will cost "tens of billions" to deploy. Once we move toward exotic weapons such as lasers, costs will multiply significantly. One estimate suggests that the missile-killing platforms proposed by the President might cost several hundred billion dollars.

In proceeding toward space weapons we have far more to lose than to gain. Taxpayers are overburdened by defense costs. A huge space weapons program would increase defense spending even further. The U.S. depends heavily on a peaceful space environment, and a space arms race would make it more costly there. Growing business interest in space systems could decline. It is these long-term considerations that have been forgotten as the U.S. moves toward a space weapons race. Ultimately, it is the public that will have to pay for any mistakes made today.

As satellite technology matures, government should look to the private sector to manage a larger share of space activities. While this rule makes sense in general, we must assure that its specific application serves the public interest. At the present time, we face this dilemma with regard to the future of METSAT (meteorological weather satellites) and LANDSAT (land remote sensing satellites) programs. Decisions now under review by the administration could affect the lives of thousands of workers, billions in tax dollars, the balance of payments, and national security.

Since the administration's decision to "commercialize" our weather and land satellites, the proposal has come under close scrutiny. The numerous studies that address this issue arrive at similar conclusions. Commercialization now could cost the government more money than it currently spends; would create government-subsidized monopolies; decrease public service; lead to decreased employment; and create foreign relations and national security problems.

The evidence indicates that we are not yet ready to "commercialize" our land and weather satellites. Still, a decision to commercialize has been made. As someone who has been actively involved in this issue for years, I believe that a reassessment is in order. Unless there is some new and startling evidence that has escaped me, I will continue my fight against this transfer.

If the private sector could operate the satellites in a true free market atmosphere and continue to provide the same level of service, then we have an entirely different story. But I see none of those elements in any of the current proposals.

In communications, the US has expanding commercial prospects and new systems ready to serve the public. But international institutes are blocking the way. The International Telecommunications Union (ITU) determines orbital space assignments and spectrum allocations. However, recent ITU conferences have shifted from legitimate communications matters to a stalemated debate on extraneous issues, such as the Middle East. In the meantime, US policymakers appear slow to develop a coordinated federal posture for these conferences. Failure to correct this situation will seriously weaken US telecommunications leadership.

As a first order, the US must restructure policymaking to assure that we speak with a single voice rather than the many one hears today. Absent a clear and coherent response and a concerted effort to work within existing or new organizations, we will deny our people the benefits that satellites offer today and remove incentives to lead this enterprise in the future.

In these three areas, a change of priorities is in order. The trend toward space weapons may entail risks and costs that are not in America's interest. Transferring METSAT and LANDSAT to the private sector makes little sense, for it could mean having to pay more for a good deal less. In making international arrangements, the ITU looks increasingly like the Law of the Sea negotiations, with some nations seeking a free ride on American shoulders. Failure to deal with these problems effectively and forcefully today will damage American interests in the future. We as a nation must:

1. Develop a comprehensive policy for outer space communications and military activities.

2. Pursue these policies with full realization that every human being in our nation will be dramatically affected by space policies in the coming years.

Senator WARNER. Thank you very much, Senator Pressler.

Do you have an opening statement, Senator Stennis?

Senator STENNIS. No, I do not, Mr. Chairman. Thank you.

Senator WARNER. I would like to direct my opening remarks to my distinguished colleagues.

Specifically, delving back in history much of your approach is predicated on philosophy. Indeed, I think a lot of this is a technological question which we will address momentarily with other witnesses.

But returning to the philosophical approach in terms of our strategy, just a short story on my own.

My father, a surgeon in the Army in World War I, fought in the trenches, was wounded and gassed. I never will forget that he instilled in me not only a sense of duty, but a hope that my generation and others would never have to witness what he saw.

I remember vividly that he took me down to the Hampton Roads area of Virginia. There we visited the old coast artillery base. They had cannons in the United States longer than this room and they fired some 20 miles out to sea. He put his arm around me and said, "Son, you never have to worry about a thing. Those guns will protect this Nation." That was 1939.

What concerns me, Senator Wallop and Senator Armstrong is what happens if we proceed on this course, lifting the words of Senator Armstrong, you said we will lift fear from the Americans of any damage to them from strategic weapons. Eventually we will be able to withdraw our own systems, I presume scrap.

Senator ARMSTRONG. A portion.

Senator WARNER. Yes. What happens to our allies? The defense of this Nation is predicated on an integrated network, not only prearrangements, but all types of arrangements with our allies.

If we were to free ourselves from fear of attack, could not the Soviet arsenal today and in the future be redirected against our allies and in that sense really destroy our philosophy of deterrence and peace on Earth being preserved by an integrated military system exemplified by NATO?

Senator WALLOP. Mr. Chairman, that is a valid question, but it begs the question. There is nothing in the suggestion of either Senator Armstrong or myself that says we walk out on those commitments or drop them unilaterally.

Clearly our commitments cannot be a reason for not developing a protection from intercontinental ballistic missiles. If space-based lasers will protect us, they will protect Europe to the extent that the weapons that threaten them are the same type that enters space and MIRV's in space and reenters the atmosphere.

We are not talking about something that will only work for America. This system we are talking about covers the oceans as well, as my testimony indicates.

Senator WARNER. I did not see that clearly set forth in your testimony. You mean this system that you envision would protect our allies?

Senator WALLOP. Of course.

Senator WARNER. From any threat of attack?

Senator WALLOP. Not any. That is one of the words that we have to keep out of our lexicon. The same thing happened to us with MX when we started talking about invulnerability. We cannot talk in absolute terms of any strategic or defensive weapons, but the day that NATO began to have most of its trouble was the day we became vulnerable and the trouble increases as our vulnerability increases.

I suggest that these systems that we are talking about in orbit cover oceans, they provide significant capability against SLBM's, IRBM's, and long-range aircraft.

Senator WARNER. Will you point out the pages to me in your testimony and perhaps in the meantime, Senator Armstrong——

Senator ARMSTRONG. Mr. Chairman, I would like to respond in a couple of ways.

STAKE IN DEFENDING EUROPE

First, it appears to me that we need to go back to the historical evolution of NATO. The notion is that first the United States has a stake in defending Europe. We all agree to that. But at the end of World War II we were unwilling to station the enormous number of troops in Europe which would permit us to do so by conventional means.

Therefore, we adopted the doctrine which I believe John Foster Dulles enunciated, of massive retaliation and, crudely put, it was if you look at us crosseyed, we will put a nuclear weapon on Moscow.

That worked fine so long as the United States had overwhelming nuclear superiority. But as the nuclear balance of power or, as it is properly characterized, balance of terror, it became increasingly doubtful in the minds of many thoughtful people in Europe and this country as well, that in fact the United States would give a nuclear response to a conventional threat someplace in Western Europe.

In fact, I, myself, am very skeptical that that would be good policy or that it would be seriously entertained. So, to the extent that the kind of weapons that we are talking about here today, that the President proposed on March 23, enhance the defensive capability of the United States, they strengthen our hands both for conventional defense and conceivably for nuclear defense in NATO.

Now, I want to make the point that what we are talking about is a purely defensive system. I am not especially endorsing a particular system, chemical laser. There are a number of ideas that have been suggested, the common denominator of which is that they are defensive in character and they are nonnuclear, they would have no potential whatsoever for attack, but only for defense against weapons fired out of the atmosphere into space as a part of an attack on this country or somewhere else. They are defensive in nature.

Senator WARNER. Is your system to protect our allies and forward-deployed troops?

Senator ARMSTRONG. It does in two ways, Mr. Chairman.

First, as I have already indicated, by enhancing the security of our homeland, thereby giving us greater freedom for our military and diplomatic action.

Second, to the extent such weapons could be used to fire upon any missiles which penetrated the stratosphere, they could be used for defending directly other nations.

Let me make this additional point because I want to emphasize what I am talking about here is shifting gears, as the President suggested, from offensive weapons to at least a stronger mix of defensive weapons.

At various times through our history, the chariot, crossbow, and siege gun have been thought to be ultimate weapons. In the last decade we have convinced ourselves that somehow thermonuclear weapons are the ultimate, there will be nothing greater than that. I don't think that is true.

I can't suggest what the next generation of weapons will be. I don't even wish to think about it. It would be contrary to what we know about history of human beings to suggest this is the ultimate weapon.

In the Middle Ages the Italian city states which were terrorized by D-guns came up with something that was basically comparable to defensive out of space, high frontier concept which the President has advocated.

It was a different way of building walls around cities, to do it in a way which had never been conceived of before, a certain design and certain placement of cannons on the walls that in fact as a practical matter made those city states invulnerable to attack and it did literally lift the threat of that from the cities which employed this particular defensive weapon.

Now, the common denominator is that it did bring peace to those cities for a very long period of time; and second, it did not threaten anybody, it was completely defensive. I think that is the kind of policy that the President advocated on March 23 and which I advocate. It is that policy rather than any particular technology that I am here to advocate.

Senator WALLOP. On page 10 of my testimony beginning with the third sentence I mention the figures I have cited——

Senator WARNER. Let me get that point. Where is it now?

Senator WALLOP. On page 10, top of the page:

> I will mention here the figures I have cited: That a chemical laser weapon could be built in 5 years or so, that a constellation of them could be in orbit in about 10 years at a cost of $5 billion for the first copy and $1 billion for each additional copy, that a system of 24 10-megawatt/10-meter stations could destroy a thousand Soviet ICBM's in 500 seconds, while at the same time protecting us from SLBM's and long-range bombers.

Senator WARNER. You say "us."

Senator WALLOP. Mr. Chairman, "us" is our allies and has never been considered to be anything different. Clearly if we can protect ourselves, the balance of our forces are a threat to the Soviet Union under any treaty we have with NATO, SEATO, or any others.

Senator WARNER. I appreciate that. I followed it very closely. This is the concern that I have. If it is your feeling that that reference there embraces the allies, I will accept your interpretation.

Senator WALLOP. Mr. Chairman, a 10-minute statement is not all-inclusive.

Senator WARNER. It seems to me that as an intrinsic part of this whole philosophical approach we have forwarded deployment, basically, we don't have any plans for the defense of NATO.

Senator WALLOP. What we can do, Mr. Chairman, in the presence of an enemy who does not agree that mutually assured destruction is mutual and has set about targeting of our military capability is capitulate and therefore our allies go with us or we can begin to do something about that and take our allies along with us. It seems to me their choice is grimmer if we do something than do nothing.

Senator WARNER. Senator Stennis?

Senator STENNIS. No questions, Mr. Chairman.

Senator WARNER. Senator Cohen?

BUILDING A SUPERIOR DEFENSE SYSTEM

Senator COHEN. Do I gather from the testimony that you would like to see us build a superior defensive system to what the Soviets might have? In other words, it is not enough to talk about building something that is defensive?

If you have something defensive and you couple it with MX and a number of admittedly offensive weapons, that does not necessarily give you more stability in light of the fact that a superior defensive system coupled with a significant offensive capability does not necessarily give you more security or stability. It might give us less.

The President indicated he might even consider turning over the same technology to the Soviets.

Senator WALLOP. I would not consider that. It seems to me that is the kind of thing that continually keeps us in trouble and would launch us on a conventional arms race that would be more expensive than anything we have up to now.

Senator COHEN. You disagree with the President that in order to add stability you would not want to share——

Senator WALLOP. I don't buy the instability argument, to tell you the truth. Those who argue the destabilization thing have a consistency problem in my estimation. They are the same ones who say we presently have enough to deter war and should not deploy anything further.

What, then, could I ask them, or anybody who subscribes to that theory, to change if you are able to defend yourself while you still have the same arsenal in your hand?

You can't have the argument both ways. It is either enough or not enough to deter war now. If it is not, the arguments they have been building and laying on us in the past are immoral and invalid.

If it is, there is nothing destabilizing building yourself protection at the same time you have a deterrent.

Senator COHEN. What about the ABM systems? Do you feel that those are stabilizing or destabilizing?

Senator WALLOP. I believe a great destabilizing situation exists right now. As I mentioned in my testimony, the Soviets have the so-called dual purpose which gives General Altunin the ability——

Senator COHEN. Not to say the current ABM system, current air defense system. I think you were talking in your statement in the context

of whether or not the Soviets have been able to drive their American-made Mack trucks through the loopholes we have had in past agreements. But whether or not past negotiators have felt that ABM systems were inherently destabilizing, that is why they agreed to limit the number of them.

I am not asking whether it violates the spirit and intent of that restriction.

Senator WALLOP. I do not buy that.

Senator COHEN. Is there anything that could be destabilizing in your judgment?

Senator WALLOP. A continued course down the path that we are presently on. I think we are on the threshold of total destabilization. I believe that.

Senator COHEN. I don't want to belabor this, but it seems to me there is merit to the argument you made in your statement about the fact that there have been treaties in the past which have been exploited, if not violated. Certainly this pertains as we go back to what a heavy missile was in SALT I—what we came out with was the SS–19. Whether or not the Soviets have a different interpretation about every facet of encryption, whatever it might be, is another example.

It seems to me if you take the attitude that anything that is arrived at is not verifiable, then some would argue we should never have any agreement with the Soviets. The point I was going to make is do you think there is any merit to the argument of having an agreement dealing with weapon systems, whether they be land based or space based?

Senator WALLOP. I agree we should pursue them. I agree if we find them to be verifiable and mutual, that we should sign them. I do not believe that we should walk away having done that and never look back to see if they remain that way, both verifiable and mutual.

The problem with these treaties is they tend to give the American people the false impression that the threat has somehow leveled out and no longer is of consequence to them.

Senator COHEN. I go back to the original point——

Senator WALLOP. I am not certain I understand your original point.

Senator COHEN. If you have a superior defensive system, purely defensive, as you described it, and you couple that with at least an equal offensive capability, you say that is not destabilizing.

Let us suppose the United States were to initiate a first strike. You have the MX, you will have the D–5, Trident II, you will have our B–1's and Stealth, a significant offensive capability.

If you were to couple that with a superior defensive capability and you were to launch a strike first and then use the satellite lasers to shoot down retaliation, doesn't that lend itself to some instability?

Senator WALLOP. Of course it does, my friend. Could I say to you that there is nothing in the history of this country that would give anybody reason to think that we would do that. We had at a time the ability to annihilate the Soviet Union, bring them to heel, do anything we chose to do to them, and did not.

There is nothing historical that says when this country has great power it abuses it.

Senator COHEN. I am trying to find out why the President would make that recommendation in a state of the Union address.

Senator WALLOP. I don't know.

Senator COHEN. When we achieve it, just to make sure the Soviets don't get nervous about the fact that we are planning on a first strike, would we make a comparable system available to them? It seems to me it at least opens up the thought that we might proceed on a parallel track with the Soviets to find some way that either one of us tries to develop systems that might inherently cause a fear that the other is going to strike first and use space to shoot down retaliation.

Senator WALLOP. If we were to achieve such a situation as you describe, immediately launch on that window of opportunity rather than the so-called window of vulnerability that we presently have and get real, genuine, and meaningful arms control such as Senator Armstrong was suggesting, that would be the first signal that we have nothing in our mind that was anything more than the ultimate peace of the world.

I believe that the world can accommodate that part of America.

Senator ARMSTRONG. Mr. Chairman, may I hitchhike on that thought and I must reluctantly then excuse myself.

I am not eager to engage in any kind of expenditure race on armaments with the Soviet Union. If I have to come down to a choice, it is an easy and simple decision to wish to engage in a defensive race with weapons which have no offensive capability rather than simply piling up missiles.

If, for example, the Soviet Union should decide they wanted to have a system just like ours and diverted their resources that are now going into piling up more and more missiles that have offensive capability against us, I would think that would be a desirable outcome. That is not the peace of the world, that is not the ultimate conclusion.

It does to that extent tend to make the world situation less dangerous. I fully support all the efforts to negotiate. It seems to me every time we negotiate and every time we sign a treaty, in a sense we are saying please don't do something that we are afraid of and yet we proceed to give them every incentive to do exactly the thing we fear the most.

HIGH FRONTIER

Whereas the deployment of a High Frontier kind of system, whether laser or conventional explosive, whatever it may be, does not have any capability of threatening the Soviet Union.

Senator COHEN. What you are suggesting is that perhaps both countries could move into a phase in which they proceed on purely defensive capability and reduce their offensive capability?

Senator ARMSTRONG. Yes. In fact, that is what I think is likely to ensue, although I think it is sound policy for the United States whether or not the Soviet Union follows our lead. I think it is a good policy for us either way.

Senator COHEN. To unilaterally produce the defensive system?

Senator ARMSTRONG. I think that it follows, and bearing in mind that any defensive system we deploy will be far less than perfect. It does not have to be perfect to be effective. I think it does hold out that as a reasonable possibility down the line.

Senator COHEN. I haven't thought of it seriously, but I point out that we sometimes labor under the impression that if we can get a jump on the Soviets, we are going to be somewhat in the clear in terms of our

technology. We are now finding out, for example, on the Scowcroft Commission report we were moving in the wrong direction on the MIRV system in the early seventies.

Now, in retrospect, that is the wrong way to go because it is destabilizing, with both sides moving to large ICBM's with MIRV'd warheads. Therefore, you are going to rethink that. I think we ought to devote as much thought as we can to exactly where we hope to be 20 years or 10 years from now.

Senator WALLOP. I would say that is the reason I said that the political and philosophical argument needs to be decided before the technical argument. I believe I can wage persuasively technological argument, but I call on the Senate to put this resolution perspective on the floor and let the Congress decide whether it is right to defend the people or not.

Senator COHEN. Thank you.

Senator WARNER. Just one concluding question.

Each year you have, I think, contributed to our strategic deterrent posture by urging adequate funding for the BMD.

This year, have you had an opportunity to look at the budget figures presently before this subcommittee to determine their adequacy?

Senator WALLOP. I think they are inadequate, Mr. Chairman. In fact, the scope of the programs has been reduced in every way. I think if they were inadequate a year ago, they are catastrophic now. I would give you at your request whatever figures in whatever timeframe you wish.

Senator WARNER. The subcommittee would again appreciate your views in the hope that we could take this into consideration as the subcommittee looks at this in subcommittee markup and then in the full committee.

Senator WALLOP. I will have those within a week, Mr. Chairman.

Senator WARNER. Fine.

Senator WALLOP. Can I say one other thing?

One thrust of the argument we indulge ourselves in that worries me most is this fear of testing the country, of doing something different than has been done. While recognizing that what we are presently doing is satisfying now, we hold ourselves hostage to our future technical potential, or technological navel gazing. Because we know we are going to do better tomorrow, we do nothing today to come to grips with problems and make decisions.

Do we philosophically say it is a good time to try to defend the people of this country? After the debate, decide it is not? I don't believe that it is a good idea to fund a near perfect system if it is not the will of the people and the design of the national thinking to do that.

On the other hand, if we don't have that debate, we will never come to a decision which I think we must.

Senator COHEN. Senator Wallop, I don't disagree with you, I think it is always open for us to constantly reexamine our policies.

I commend you for introducing the resolution, but I don't think we should do it in the context in which you placed it here, that it is time for Congress to decide whether or not it wants to defend the American people. The implication is if you don't vote to support such a proposal, you are not interested in defending the American people.

It may very well be that there are other ways of defending the American people without going to it. I don't know.

Senator WALLOP. There may well be.

Senator COHEN. If you postulate it that way, somehow you want to defend us or——

Senator WALLOP. My thesis is this: That we are not now well defended. We have a vast defensive establishment, but our thesis is that we will use most of our armaments tc destroy Soviet citizens. I don't believe the President of the United States can make that decision.

If all he has left at the end of riding out a first strike—which is essentially a policy that has been advocated, and subscribed to in stronger or weaker terms over the course of time—if all he has left, after having been hit by whatever comes, is the option to shoot at Soviet cities, is that the only significant defensive capability?

If it is, I don't think the President would choose that option. I don't believe that leaves this country defended. It has enormous power and I don't deny that. I don't believe that the power can be directed at Soviet citizenry. If there is a reason for the Catholic bishop's argument, that has to be the place where it starts.

So I question, despite all that we have spent and all the earnestness that has gone into this debate, if we, at this moment in time, have a defense we could use. That ought to be part of the debate.

Senator COHEN. I agree.

Senator WARNER. Thank you very much, Senators.

The subcommittee will now turn to testimony from senior officials of the Department of Defense charged with the responsibility of refining and implementing the President's announced policy with respect to space-based strategic systems.

We are pleased to have Dr. Robert Cooper, Director, Defense Advanced Research Projects Agency; Dr. William Hoehn, principle Deputy Assistant Secretary of Defense for International Security Policy; Dr. Charles Cook, Deputy Assistant Secretary of the Air Force for Space Plans and Policy; and John L. Gardner, Director, Defensive Systems, in the Office of the Under Secretary of Defense.

Thank you, gentlemen, for coming today.

Dr. Cooper, you may proceed.

STATEMENT OF DR. ROBERT COOPER, DIRECTOR, DEFENSE ADVANCED RESEARCH PROJECTS AGENCY

Dr. COOPER. Thank you very much, Mr. Chairman. We are happy to be here this afternoon.

Senator WARNER. We will conduct part of this hearing in open session and may go into closed session.

Dr. COOPER. We are pleased to be here this afternoon to discuss with you the defense planning and activity associated with the President's March 23 statement of his desires.

The President has directed a study to address the role defensive system deployments could play in future national security strategy and to define a research and development program aimed at the ultimate goal of eliminating the threat posed by nuclear ballistic missiles.

We in the Department of Defense are eagerly responding to this new challenge to explore new technologies and strategies with the aim of substantially reducing our dependence on the deterrent threat of nu-

clear retaliation for preserving national security by creating a future option for an effective defense against ballistic missiles.

The President has indicated that our efforts should be focused on the long term. We are not interested in premature commitments to near-term weapon system concepts which will certainly have limited effectiveness and the pursuit of which will detour us from developing those technologies that may eventually be truly effective.

We are enthusiastic about exploring alternatives and selecting the technologies required to meet the challenge. Nevertheless, we are fully aware of the great technical challenge we face.

OVERCOMING THREAT OF BALLISTIC MISSION ATTACK

With this challenge in mind, our plan is to analyze those ongoing and proposed defense research programs which could contribute to achieving the President's goal, to develop an understanding of the military strategy and national policy implications of developing a capability to overcome the threat of ballistic missile attack, and to evolve a long-term research plan for the President's consideration and approval.

The technological areas to be considered will range from fundamental research on detectors for advanced surveillance and target acquisition systems to specific kinds of weapons.

The strategy and policy considerations will also be broad and encompass all aspects of the military and political implications of these efforts. The study efforts will be accomplished through an interagency study group chaired by the Deputy Secretary of Defense.

As the Secretary of Defense has stated, we will not be seeking to develop a single system which can intercept and defend flawlessly against all missiles and all attacks. Such a system may not be possible.

Rather, what we will be doing is broadening our research efforts so that in the future we may be able to create a defense in depth—a layered series of systems which taken together will prove a reliable and effective defense against ballistic missiles.

We can envision system concepts designed to exploit the various vulnerabilities of ballistic missiles throughout their flight regimes from launch to impact. We do, for example, have a good understanding of how to engage and neutralize ballistic reentry vehicles in the terminal phase of their flight.

But, in general, we will be dependent upon a considerable advance in a broad technological front to be as effective at every echelon of a multilateral defense.

The reasons for initiating this effort now are many. In conventional theater war, the concept of such a defensive capability is accepted. In that type of conflict it has always been our strategy to maintain both strong offensive and strong defensive capabilities to inhibit or discourage attack.

STRATEGIC NUCLEAR ARENA

In the strategic nuclear arena, however, we have maintained only a strong offensive force posture since the ABM treaty was signed and the Safeguard system was mothballed. What has changed to elicit the renewed interest in defense against ballistic missiles?

In short, no one research breakthrough is responsible. Instead progress across a broad research front has brought with it new opportunities for an effective defense. Gains in information processing, electronics, materials, directed energy devices, and other technologies prompt a new look at what capability the confluence of these new and yet to be exploited technologies may provide.

We do not know at this time what new research should be initiated or what ongoing programs should be strengthened.

Since the primary focus of our activities will be the creation of a long-range research plan, our fiscal year 1984 budget request is not expected to be impacted.

Previous testimony related to research in defensive areas that was presented earlier this year before this committee in support of the President's fiscal year 1984 budget request. This was the product of detailed analysis, in-depth consideration, and the scrutiny of the normal DOD review process.

The goals and objectives of the programs presented at that time are not dissimilar from those enunciated by the President on March 23, and we do not expect major changes in them.

I specifically refer to hearings held by this subcommittee on March 23, 1983, on strategic defense which included our ballistic-missile defense and directed energy programs.

Augmentation or accelerations, although some are possible and are certainly being studied, are not expected at this time. I anticipate that our studies will require several months of intense effort before a plan can be developed.

The impact of our conclusions will likely be documented in the fiscal year 1985 budget request. Should changes to our fiscal year 1984 program be necessary, we shall so advise the Congress.

I would now like to turn briefly to some of the military strategy and policy implications of the President's initiative.

In seeking an effective defense against nuclear ballistic missiles, the President has not committed the Nation to a change—now or in the future—in our longstanding policy of deterrence. Rather, he has committed us to an active and, we would hope, fruitful search for a means of deterring war that moves us away from dependence on offensive force retaliation and toward a greater reliance on defense against attack.

STRENGTHENING DETERRENCE

In removing an aggressor's ability to attack us successfully rather than to threaten retaliation after an attack has taken place, deterrence will be strengthened.

But this strengthened deterrence which the President's guidance seeks to achieve will in no way alter our unshakable commitment to the defense of our allies. Our offensive weapons exist today for the purpose of deterring attack on not only the United States, but our allies as well.

A change in the means of securing that deterrence will neither change that commitment nor affect our ability to meet it.

In parallel with deterrence, an important part of our effort to preserve the peace is our goal of reaching equitable, verifiable arms control

agreements that reduce the destructive potential of the U.S. and Soviet arsenals and reduce the chance that these arsenals will ever be used.

Such efforts will certainly strengthen the potential effectiveness of future defensive systems which could result from our current efforts.

START PROPOSAL

Today, under our START proposal, we are attempting to reach common ground with the Soviet Union, in large part for the purpose of significantly curtailing those strategic forces that are potentially the most destabilizing, fast flying, accurate ballistic missiles.

Because our search for defensive technologies is driven by the goal of reducing the effectiveness of ballistic missiles, it is fully consistent with the arms reduction effort we are pursuing today. And, indeed, the President did connect these two in his address to the Nation on March 23. It also is consistent with existing arms control agreements.

While the ABM Treaty does prohibit the development, the testing, and deployment of ABM systems or components which are sea-, air-, space-, or mobile land-based, it does permit research into such systems. Subject to negotiated limits, the treaty also makes provision for systems based on new physical principles.

But while we look with hope toward the future, we must remain mindful of the requirements the present imposes on us if we are to reach the future safely. Thus, we must continue, for the interim, to rely on the offensive arm of deterrence to preserve the peace.

This, in turn, requires that we commit ourselves to the modernization of our nuclear forces. Last week, the President announced the final part of the modernization plan—the modernization of our ICBM force.

Based on the recommendations of the Scowcroft Commission, the President's program calls for continued research in a number of technology areas to improve ICBM survivability.

One of the technologies identified, ballistic missile defense, will continue to be pursued not only to provide an option for enhancing ICBM survivability over the next few years, but also to serve as a potential component of a future comprehensive defense system.

The study that the President has directed is clearly aimed at the purpose that he puts forth, that is to eliminate the threat posed by nuclear ballistic missiles. This study is being accomplished through the interagency group chaired by the Deputy Secretary of Defense, Mr. Thayer. The President has asked us to submit to him this fall our research plan with proposed changes, and recommended programs for the fiscal year 1985 budget time period.

We expect to be able at that time to better understand the overall research goals that we will be setting for ourselves. In addition we will be in a better position to tell you of detailed program changes that might result.

That is the end of our prepared statement, Mr. Chairman. We are all here to answer any questions that you have about our ongoing research program, the general structure of the activity which will lead up to structuring new research programs or any of the strategy and policy issues which we will be addressing in the future in relationship to the President's initiative.

Thank you.

Senator WARNER. Thank you very much.

Coincidentally, when the subcommittee met on the 23d of March, we were here at 8 o'clock in the morning and finished around 12:30 p.m., the President's speech was that night. Not that he needs to consult me on any of his speech material, but I was somehow caught by surprise.

To what extent were you somewhat caught by surprise?

Dr. COOPER. Let me say that I was not the least bit surprised by the President's speech. I was, I guess, pleasantly surprised by the breadth and depth of the conviction that he expressed in that speech.

NEW DIRECTION IN DEFENSE TECHNOLOGY

But let me sort of paint for you the picture that I viewed of the events leading up to the President's decision to make this new direction in defensive technology.

I came to the Defense Department from a small company that is located here in the Washington area in the fall of 1981. So I had some catching up to do with the administration which had been in office for some period of time. In so doing I had a number of conversations with senior Defense officials, and senior officials in the White House.

It was clear at that time from those discussions that there was great concern in the administration about the whole issue of strategic defense.

Since that time in the fall of 1981, I have had a number of private conversations with the Secretary of Defense, and with the President's science adviser, and these issues have come up many times.

The issue was: "Dr. Cooper, when are we going to be able to accomplish this thing technically, and what do you need to be able to provide the research base in order to make this possible at some time in the future?"

My answers at that time were similar to my answers today, and, that is, we don't know how to do this job today technically. We are not in a position to do it.

Yet we do have strong fundamental research programs which we believe were adequately funded and we so stated that in the 1982 fiscal year testimony that we gave to this committee and also in the recent testimony on March 23.

The renewed focus that the President has placed on this by setting it at a high national priority now requires that we go back and look at the breadth of our research programs to make sure that we are doing all that can be done across the breadth and depth of the technology which would certainly be involved.

I certainly would like to discuss those with you and what some of the options are there. Typically in the past, in our research programs we have tried to select out the key issues that would enable us to create defensive systems of the sort that the President had in mind in his speech and we have focused our attention on those key technologies.

There may be other technologies which we have not focused our attention on which, with this new Presidential focus, would certainly be the center of our attention now.

Senator WARNER. You said at this present time the United States does not know technically how to do it, is that correct?

Dr. COOPER. That is correct.

Senator WARNER. The President tells Americans, however, that maybe we were beyond the technical threshold and on the way. I will go back and read his statement.

Dr. COOPER. I don't believe that is what the President said. As a matter of fact, I happen to have with me the single page from the New York Times that carried the verbatim text of the President's address that evening.

On the issue of whether we are ready to do this or not the President essentially said, and I will paraphrase it——

Senator WARNER. I think it is important that you read it into the record.

Dr. COOPER. OK.

He says:

Tonight consistent with our obligations under the ABM Treaty and recognizing the need for close consultation with our allies, I am taking an important first step. I am directing a comprehensive and intensive effort to define a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles.

Now, the "begin to achieve our ultimate goal of eliminating the threat" really referred to the fact that he recognized this was a long-term endeavor and that we could not accomplish that purpose which he had in mind, which is to remove completely the threat of nuclear ballistic missiles to the United States. It doesn't mean that we don't have technical capabilities now to accomplish perhaps far lesser achievements.

Indeed, we have been working in theABM program on systems that could have considerable success against attacks on our strategic land-based ICBM force. But as to the matter of completely erasing the threat of nuclear ballistic missiles from the consideration of the U.S. population, that certainly is beyond our technical capability today.

Senator WARNER. What is the period of time within which this Nation could deliver the goals set forth by the President in that speech?

Dr. COOPER. That is hard to say. We have said before with the most exotic elements of our research program involving the directed energy weapons that it will be many years before we can even decide whether it is feasible to take the next step toward the proof of feasibility of those technologies as used against ballistic missiles.

Senator WARNER. What is "many years?" That is a very inconclusive definition.

Dr. COOPER. Sir, the precise base of our program is classified and in this forum I can't respond directly to that. But certainly it is within the scope of the President's assertion in his speech that it may be many decades before we would be able to accomplish this purpose.

Senator WARNER. One last question and I will defer to my colleague and then I have a number of technical questions.

A previous panel took a great deal of courage to testify here and I admire them for it. I carefully listened to the Senator from Wyoming and I am sure you followed that dialog.

I was asking him about the impact on our overall strategy coupled with our allies. He directed me to page 10. The system that he was depicting, assuming you could grasp what he was depicting, would that, in effect, provide an equal system for our allies in Europe?

Dr. COOPER. First of all, sir, the system that he was depicting, I believe, as I testified before, is not feasible for us to design and develop today. It could be at some time in the future, but in any event, that system alone could not achieve the purpose that the President had in mind.

The only way of accomplishing the President's purpose would be to accomplish a defense in depth which means providing systems and capabilities that could repeatedly throughout the flight regimes of ICBM's assess, engage, and then reassess and reengage the weapons themselves.

Any defense that could be created of this sort would certainly have awesome power against a wide variety of threats, not only against the United States, but against our allies. Suitably deployed, those systems could at least, in principal, also defend our allies and, as the President stated, it is our purpose to work on defensive technologies in concert with our allies and to provide defensive capability that could also be used to defend them.

Senator QUAYLE. Senator Cohen?

Senator COHEN. I have a couple points, Mr. Chairman.

DETERRING SOVIET NUCLEAR AGGRESSION

Dr. Cooper, do you believe that we have a capability of deterring Soviet nuclear aggression at this point?

Dr. COOPER. I guess the only evidence that we have for that is that there has not been nuclear conflict and the Soviets have been deterred. We have had literally 37 years now, going on 38 years, of no strategic conflict involving nuclear weapons. That is, no nuclear weapons have been detonated in anger since those that were detonated at the end of the Second World War.

Deterrence as a strategy certainly has fulfilled its purpose as best we can understand it up to now.

Now that does not mean that changes that occurred in the last 10 years could not change that situation, and that our current strategy will continue to be successful.

Senator COHEN. I raise it because I am a bit confused about the testimony that we have had from various sources in recent months.

I believe Senator Wallop indicated we can't defend America under the current strategic program that we have. We can't defend against incoming missiles.

Then several weeks ago we had testimony from a number of people that we don't have an adequate deterrent in our current inventory.

It seems to me that we, No. 1, can't defend ourselves, and No. 2, don't have an adequate deterrent. I believe we have a capability today. It is going to be improved, in my judgment, when we do in fact modernize with different systems.

But I think we make a mistake in saying we are somehow defenseless. If in fact, we are in the position that Senator Wallop suggests, that the President will not send missiles to Moscow, then I don't know what will be gained even under a High Frontier system.

If we describe the scenario that I foresee, where we have a superior defensive capability in space plus a very offensive capability here on Earth in the United States, it seems to me that that is not necessarily a

stabilizing situation. It could in fact produce an exchange which we would like to avoid.

SOUTH AFRICA AS NEXT PERSIAN GULF

I am trying to think, for example, of a situation of crisis—let me describe 10 years in the future—in which we have the system and we have a crisis in South Africa. We will describe South Africa as being the next Persian Gulf.

At that point the future President draws a line in the desert of Africa, as President Carter drew a line in the desert of Saudi Arabia and said this is in our strategic interest, vital to our security in the future, and at that particular point we have Soviets going on alert, as they did back in 1973. As I recall, the Soviets went on alert because of the Middle East confrontation, when we went on alert during 1973. Let us say the Soviets are on alert now and we are both on alert—we have the system up in the sky as well as ICBM's and SLBM's.

In your judgment, do you think the Soviets would have an incentive to strike first or wait until we fired and then knock down our ICBM's on their retaliation?

Isn't there some element of instability there when you combine an offensive and a superior defensive capability? Am I wrong on that?

Dr. COOPER. I don't view personally that there is a connection between the possession of a defensive capability and the destabilization issue. I think both defensive weapons in strategic technology and offensive weapons can work together jointly to provide a deterrent.

On the first question that you asked, though, which was the question of do we have an adequate offensive force for deterrence, and do we have a defensive capability, and can we defend ourselves. Those are really two separate questions that are different in nature.

First of all, the question of whether our strategic offensive forces are adequate for deterrence is a matter of judgment.

Senator COHEN. What is your judgment?

Dr. COOPER. And people of goodwill will differ in that judgment. The question of whether we have adequate defensive weapons to defend ourselves against strategic attack is a matter of fact. The fact is that we do not have them.

Senator COHEN. That is when we decided not to follow that particular type of defense. We chose not to go to underground defensive systems, civil defense bunkers and such. We chose not to go with the ABM. That was a matter of choice on our part.

Dr. COOPER. That is true.

Senator COHEN. I have no objection to considering other alternatives. I commend Senator Wallop and those who are coming forward.

I want to be sure that we examine it fairly thoroughly in terms of exactly what the premise is going to be and whether or not we can foresee certain scenarios in which we are not that much better off than we are today without some sort of arms control agreement.

In fact, we are talking now about the Scowcroft Commission. The Scowcroft Commission I think is being somewhat misinterpreted. It is a very balanced report, in my judgment, and the emphasis so far as I am concerned has to be on the arms control aspect rather than the MX.

You ask anyone on the Commission and they will say the MX alone should not be built because it does not make much military sense to

put it in existing silos, but they see it as a political lever to get us to a long-range mobile Midgetman missile, which may make it more stablizing.

We overlook the fact that primary emphasis without arms control doesn't make any sense and Midgetman doesn't make any sense. Each one can be overwhelmed by the other side by adding more and more missiles.

I have no objection to talking about and going into R&D programs on High Frontier. But we have to have a pretty good idea of where we are both heading because the Soviets certainly are going to be looking with a great deal of envy at our technology.

They are either going to try to steal it or in some way have access as they have over everything we have built today. They will not be that much further behind us 5 years from now. I think we have to place that in context.

CUTTING STRATEGIC BUDGET

The question then becomes, this panel's proposal shifted recommendations somewhat based on the President's placing higher priority on High Frontier than it did prior to your testimony last time. The question was asked, I believe by Senator Warner at that time. Well, if that is the case, what are you going to recommend that we cut out in the current strategic budget?

We are going to the floor this week and we know that the Budget Committee has reduced the President's program from a 10-percent increase down to a 5-percent increase.

The Republicans in the Senate may try to push it back up to 7½ percent and we may finally compromise in the House. We have half of what the President talked about now. Now you are talking about putting more money in the High Frontier.

Where do we get it, No. 1? And what would you recommend we eliminate from the current budget?

Dr. COOPER. First of all, let me respond to the terminology that you are using, that is High Frontier technology.

We are not advocating and will not be in a position to advocate for some time, any specific system approach toward ballistic missile defense. We are going to be looking broadly at a wide variety of technologies which could apply to a defense in depth capability for the United States.

So, whether or not any space-based parts of such a system will finally be focused on as having the greatest potential and be broken out for emphasis in this program is yet to be determined.

I would suspect we would be in a much better position to give you some view of that this fall than we are today. I think that for the time being you should look generally at what we are trying to do, and look broadly at defensive technologies to see what the premise is and where we should put our emphasis.

Now, on the general question of whether we are going to be in a position that will place us close to the President's goal in this decade or in this century, there is no way of determining that at this stage.

Senator COHEN. Thank you, Mr. Chairman.

Senator WARNER. Thank you very much.

In what ways does your plan differ from those of 6 months ago with reference to the overall planning and programing for this area?

Dr. COOPER. Mr. Chairman, we see no changes in our plans for the fiscal year 1984 budget year.

Senator WARNER. That is what you said in your statement.

Dr. COOPER. That is correct.

Senator QUAYLE. Does your statement fully answer that question?

Dr. COOPER. I believe it does.

Senator WARNER. What in your view is the single greatest factor limiting our actions in the field of space-based ballistic missile defense? Is it financial resources or technological uncertainty?

Dr. COOPER. I think basically it is the technological uncertainty that we face in this general area. I think the single thing that we have not focused attention on in the past, which may represent the most stressing technological problem, is the complexity of any comprehensive battle that we would have to wage against a large-scale strategic missile attack.

It is the battle management problem, if you want to characterize it that way. Currently we have no way of understanding or dealing with the problems of battle management in a ballistic missile attack ranging upward of many thousands of launches in a short period of time.

This is the problem that we would face in the projected threat environment that the Soviets could project against us.

Senator WARNER. In the Scowcroft Commission report there are findings that indicate considerable skepticism as to the applicability of current ABM technology for the defense of the United States. Typically, they indicate at this time "No ABM technology appears at the time having practicality of survivability, at low cost and technical effectiveness sufficient to justify beyond the stage of technology development."

Is your present program consistent with this finding?

Dr. COOPER. Yes, indeed. We agree with the Scowcroft Commission's conclusion in that general area. That is, our program will be a program of research and will not be related to development at all for many years in the future. We have many technical challenges before us before we would be able to consider the kind of defensive system that could achieve the President's long-range goal.

Senator WARNER. Gentlemen, we have considerable work to achieve here before 5 o'clock at which time I and all other members have to assemble for a budget meeting.

I think we will not go into the closed session unless there is a specific request by any member of this subcommittee. I had safeguarded that option if one or more desired it.

Before dismissing you, do other members of your panel desire to say anything with reference to what has transpired here today?

STATEMENT OF DR. WILLIAM HOEHN, PRINCIPAL DEPUTY ASSISTANT SECRETARY OF DEFENSE FOR INTERNATIONAL SECURITY POLICY

Mr. HOEHN. Mr. Chairman, before retiring, I think it is incumbent to make one short comment on the issue that was suggested by the preceding witnesses that our strategy is one based on mutually assured destruction, or MAD. That is not our current policy. It has not

been the policy or strategy of any administration within my living memory.

I think we need to have that declaration made clear for the record.

Senator WARNER. I am glad you included that point.

Dr. Cook.

STATEMENT OF DR. CHARLES COOK, DEPUTY ASSISTANT SECRETARY OF THE AIR FORCE FOR SPACE PLANS AND POLICY

Dr. COOK. I would like to make one comment that keeps coming to my mind in the testimony. There would appear to be a great difference of judgment with regard to when we could have certain capabilities.

I would like to point out that I am not sure that the various people discussing these are using the same frame of reference. I think some people tend to regard having a system capability is when, for example, you could orbit a laser in space. As a matter of fact, you can do that in a technological sense. There is a significant difference between being able to do that kind of thing and having an effective system. I think this is the thing that Dr. Cooper was saying, that it is the battle management aspect that takes considerable time and effort.

Senator WARNER. It is integration?

Dr. COOK. Integration is sufficiently difficult and not all that well understood by a lot of people and that is some of the difference in the time scale.

Senator WARNER. That is one of the points I was trying to bring out in my questioning of my colleague from Wyoming, Mr. Wallop, about the applicability of this system in terms of our allies. I presume that we would quantitatively have to upgrade the number of components in the integration of the system to spread it worldwide.

Is that a fair assumption?

Dr. COOPER. That is a fair assumption.

Senator WARNER. I did not want to press on him, but I presume we would have to go into a cost-sharing basis like NATO unless the United States is going to bear the full cost.

Would that be a fair question?

Dr. COOPER. It is our purpose to consult with our allies in NATO and to the extent that they can contribute to the program, we certainly would welcome joint participation.

Senator WARNER. If we were to move in that direction where we would establish a system envisioned by Mr. Wallop, there is a cost-sharing element in there, is there not, if it is going to protect the whole world?

Dr. COOPER. There certainly could be rationally, I would imagine.

Senator WARNER. How do you define our obligations under the ABM Treaty as they relate to space-based lasers?

Dr. COOPER. Basically, the ABM Treaty limits some of the things that we can do in ballistic missile defense research.

What the President certainly was referring to was that we have no intention of doing anything in our research programs that would violate any provision of the ABM Treaty. We would not go beyond research into any kind of development of deployment activities which are proscribed by the Treaty.

Senator WARNER. Would you submit for the record an analysis of that.

[The information follows:]

SPACE DEFENSE

Senator WARNER. How do you define our obligations under the ABM Treaty as they relate to space-based lasers?

Dr. COOPER. The ABM Treaty bans the development,[1] testing, and deployment of all ABM systems and components that are sea-based, air-based, space-based, or mobile land-based. In addition, although the Treaty allows the development and testing of fixed, land-based ABM systems and components based on other physical principles (such as lasers or particle beams) and including such fixed, land-based components capable of substituting for ABM interceptor missiles, ABM launchers, or ABM radars, the Treaty prohibits the deployment of such fixed, land-based systems and components unless the Parties consult and amend the Treaty.

Senator WARNER. How do you respond to Wallop's comments that no existing treaty limits space-based or other weapons of mass destruction?

Mr. HOEHN. I think again in many respects the ABM Treaty has the same kind of loophole problem with regard to things that are not specifically covered, that were not specifically envisioned as elements of an ABM system at the time it was developed. Therefore, there is some latitude for discretionary interpretation.

I do not believe that we have come down upon a firm, full and fixed interpretation of all of that since we have not had the necessity to do that previously. Therefore, the question, I think, is one that will clearly be considered in the policy aspect of the study which the President has commissioned which we will be reporting on this fall.

That is surely one of many arms control issues that we will have to look into.

Senator WARNER. Gentlemen, there are many, many questions I would like to propound. This is a subject of intense interest to me.

Once again, back to Mr. Wallop's proposition, in order to put that system, if it could be defined, into being, it would require a very close working relationship with our allies, presumably joint funding.

I presume all allies would want it as much as we do. The original concept of it is does it embrace the protection of the entire world or just the United States?

Dr. COOPER. The original concept was so broad and so pervasive that it could be used to protect almost any part of the entire world.

Now, making the provisions within a system of that sort to actually accomplish that could certainly increase the expense and the complexity of the system itself.

Senator WARNER. We are about to hear from General Graham on the system referred to as High Frontier. I think he has sole title to that name. We have used it liberally today in the term of a broader context.

Have you had an opportunity to update yourself on his proposal?

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[1] The U.S. interpretation of the term "development," as used in the ABM Treaty, is as follows:

"The obligation not to develop such systems, devices or warheads would be applicable only to that stage of development which follows laboratory development and testing. The prohibitions on development contained in the ABM Treaty would start at that part of the development process where field testing is initiated on either a prototype or bread-board model."

Dr. COOPER. Yes, indeed. We received an early copy of the High Frontier study which enunicated, at least as one of its parts, a global ballistic missile defense system based on concepts that were not dissimilar from those studies in the early 1960's at ARPA, called the Bambi system, as a matter of fact.

That technology is an interesting technology. It was deemed at the time it was studied in the sixties not to provide a cost-effective potential for ballistic missile defense.

As best I can understand now, there has not been that much change in the technology associated with those systems to make it attractive today.

Senator WARNER. In conclusion, then, the Department of Defense through yourselves and others has not availed itself of the suggestion of High Frontier, Inc., and particularly General Graham, and it is still the conclusion of the Secretary of Defense at this time not to embark on a system such as that, is that correct?

Dr. COOPER. That is correct. General Graham has contacted us and has offered his assistance with the study which we will have ongoing this summer for the next 5 months or so. We have accepted that offer of assistance and we will be looking at that general area of technology which he studied so vigorously last year.

Senator WARNER. I think you would be very wise.

Let me read from the testimony given on March 23, before this subcommittee in response to a question that I put to Mr. Gardner. I am quoting Mr. Gardner:

> We have conducted studies, both in the Army and Air Force on the High Frontier concept. Certainly those studies were associated with understanding the concept identifying technological issues and risks. They work to optimize the system and estimating the cost for deployed systems as well as its survivability. Let me say in order to describe it fully would take some considerable time.
>
> In summary, let me say that it was the judgment of the people that have done these studies that the technological content of the High Frontier system appears to be certainly feasible and not extraordinarily risky, although developed components are not available, in our mind.

Would you care to amplify that a little bit?

Dr. COOPER. John, do you want to field that question?

STATEMENT OF MR. JOHN L. GARDNER, DIRECTOR, DEFENSIVE SYSTEMS (OUSDRE)

Mr. GARDNER. We did conduct the study that I described. We went through the analysis that is described there. I believe that we would stand by the comments that we made at that time.

As you recall, in those statements what we were discussing was the question of feasibility of the systems that they described in the sense that the components of it appeared to be capable to produce what they said.

On the other hand, there is a large amount of uncertainty associated with how effective the system would be if deployed in the field. I think you will notice that we voiced those reservations.

One of the more serious of those reservations had to do with the survivability of the system, as I think you will note my testimony that I noted. An adequate examination of the survivability of that kind of system has not been made.

We also expressed serious reservations about the cost estimates of the system, indicating that even preliminarily estimates on our part indicate that systems of that design were quite expensive.

Senator WARNER. Gentlemen, we must press on with the next panel. Thank you very much for your appearance today.

The subcommittee will continue its deliberations on the President's announced space-based strategic defense system by hearing from three nongovernmental witnesses who have been prominent in the public debate on this subject.

Dr. Edward Teller needs no introduction to members of this committee. His record of service and scientific accomplishment in the field of national defense is well known. Dr. Teller currently serves as a senior fellow of the Hoover Institution and has graciously adjusted his schedule to participate in this session.

Lt. Gen. Daniel Graham, U.S. Army, retired, is the driving force behind the High Frontier program and has been a most vocal advocate of an accelerated deployment of a space-based defense system. General Graham appeared before this subcommittee roughly 1 year ago and we are pleased to have him available to inform our deliberations today.

Dr. Richard Garwin is the IBM fellow at the Thomas J. Watson Research Center in New York. He has been sharply critical of the technical feasibility of space-based defense systems and we are confident that his testimony this afternoon will insure a lively and provocative discussion.

Finally, let me note that the subcommittee is particularly grateful to Dr. George Rathjens who agreed to appear at the previously scheduled session of this hearing but was unable to attend our meeting today. His prepared remarks will be introduced into the record at the appropriate point.

As is the committee practice, we shall hear from all of our witnesses prior to entertaining questions from the members.

Dr. Teller, you need no introduction to this subcommittee. Your record of service and scientific accomplishments in the field of national defense are well known. I personally consider it a privilege that you have rearranged your schedule at my request to appear here today.

You may proceed as you wish.

STATEMENT OF DR. EDWARD TELLER, SENIOR FELLOW, HOOVER INSTITUTION

Dr. TELLER. Senator Warner, it is a great honor and a pleasure to appear here. Thank you very much.

In view of your program, may I ask you how long a statement do you want me to make?

Senator WARNER. Dr. Teller, when we last talked, you had been before the House Armed Services Committee. I would hope that you would provide this committee with at least equal breadth and scope of what you provided to the House of Representatives.

Dr. TELLER. My full statement there took 50 minutes. Then there were quite a few questions. I will be glad to talk in approximately the same detail, but I imagine you might want me to try to talk more briefly.

Senator WARNER. Now, we have your testimony before the House. That will be made a part of this record as written. My suggestion, therefore, would be for you to summarize that statement. In that way we have the benefit of your amplification of that testimony as well as any questions we might have.

Dr. TELLER. I would love to give the summary. I shall do so. I am by all means prepared to answer any questions pertaining thereto.

Senator WARNER. Thank you.

DEFENSE VERSUS OFFENSE

Dr. TELLER. To my mind, the President's statement of March 23 challenging the technical and scientific community to produce a valid comprehensive defensive system as secure as possible was an act of great historic import.

It is true, and I believe the President's challenge was in good part based on information he had received, that there are a number of novel, hopeful ways in which defense can prevail over offense.

It might be good to repeat an important point. At the end of the First World War it was generally believed that defense was more effective than offense by a factor of 4.

In the Second World War this situation was reversed. It was generally accepted that against the atomic bomb there is no defense and there can be no defense.

In my own mind, I believe it in the 1950's, I doubted it in the 1960's, I strongly hoped for the opposite in the 1970's, and now in the last few years I am convinced by the excellent work of young collaborators that real defense is not an impossibility.

Indeed, the Soviet Union in all probability is already working on such a defense and on some of our important ideas we have reason to believe that the Soviet Union is ahead of us.

Deterrence by retaliation is a balance of terror. The terror is certain, the balance is not. In fact, if a defensive system is found by the Soviets, then I think we will be, with our present policies, in a helpless situation. To devote extremely serious research to the possibility of defense seems to me imperative.

Now we have here a very general, basic, and difficult problem, a political problem. An infeasible idea on defense can be published, and then is strongly disapproved in the press, and very often rightly so. Those ideas which have real hope are generally kept secret. They cannot even be published, and discussions concerning them are governed by relatively ill-defined rumors or fiction.

The result is that the American people remain uninformed, we have disinformation; not that we want it, but it happens this way.

THIRD GENERATION NUCLEAR WEAPONS

I think it is important to emphasize that there are a great number of different defensive systems ranging from new methods of detecting airplanes and cruise missiles to new types of nuclear weapons.

It would be an impossibility to try to give a reasonable evaluation of all of them. I therefore want to limit myself in my testimony here

to the two main topics I mentioned last Thursday to the House Armed Services Committee.

These are not the only ones. They are certainly the most important or at least among the most important.

One of them we summarize under the title "Third Generation Nuclear Weapons." I think I will be allowed in open testimony to say that the underlying ideas are now. A scientist of very good repute has denied their feasibility, then studied them for 2 days and reversed his opinion.

He still maintains that they are militarily not feasible. He is concerned with deployment, reliability, a great number of questions, where I think past experience shows that if we really put our back into the job, it can be done.

I would like to give two important details about these type of nuclear weapons, not real details, but the kind of description that might give you an idea of what we are talking about.

Nuclear weapons are known for their great and obvious indiscriminate destructive power, Nuclear weapons can be made very powerful. However, one can make nuclear weapons, which are smaller and even very smart. All of them concentrate energy, in a manner found only in the center of stars.

This concentration of energy can be exploited to give rise to another effect which has been intensely discussed in the last few years, and we have every evidence that the Soviets know about this, in fact they probably are ahead of us. Therefore, I repeat that denial of this information to the public is unjustified and even dangerous, that what is known to the Soviets should be known to the American people.

Unfortunately not every bureaucrat follows this wise injunction and I am constrained by bureaucratic redtape.

Now, the energy concentration about which I am talking makes it possible to direct that energy not indiscriminately, not against cities, or people, or even Soviet silos, but directed against weapons in action which is, I think, a good characteristic of a defensive weapon.

The remarkable point is that the movement having started in Livermore has spread to Los Alamos and Sandia. The three laboratories are in essential agreement.

If you plan for the future, you cannot expect detailed agreement. But in the weapons laboratories there is a vivid interest in how to do the research and how to make a reality out of defensive weapons if indeed it can have military significance.

So, the high energy concentration which makes new types of effectiveness a real possibility is one of the very important points.

OBSERVATION FROM SPACE

The other important point is this: I believe we should not deploy weapons in space, and in this sense to talk about star wars is a most inappropriate description of what the main question is. To put objects into space is expensive. To destroy space-objects is relatively easy. But we do need space. We need space badly if for no other reason than for observation—knowledge when an attack is launched.

Whether or not we can keep relatively few eyes in the sky is a serious question. There are a number of proposals for how this can be

done. None of them easy. They are most challenging. We are working on them. We have to work on them. Certainty of success is not the impression I want to give.

At least one very important point is that instead of having battle stations in space, we should direct ourselves to pop-up a defensive object when the need for that exists and for that purpose early indications are necessary and among these early indicators the space satellites are most important.

They are not the only ones, but their loss would be a very severe blow and therefore this involves an essential question. Our defense cannot be perfect, but for me to try to achieve perfection would seem most important. However, it is quite true that short of perfection the deterrence could be effective by inducing doubts in the minds of the policymakers of the Kremlin.

If we manage to create serious doubts, then I believe attack will never come because I am very confident that the Soviets are not adventurers, and when they don't have a solid prospect of winning, they do not start a fight. This is one important aspect of the whole defensive posture.

LASERS

Now, having given indications of third generation weapons, I may mention the words that have been on the lips of many people, X-ray lasers and electromagnetic pulse generation. Having said that these are all in the game in various forms, I would now like to come to the second class of weapons which I want to emphasize. They are lasers, and now I mean common lasers.

Here the general situation is that the longer the wave length of the laser, the easier it is to deploy it, the easier it is to make it work. Also the easier it is for the attacking missiles to prevent the damage from such a laser.

The result is that infrared lasers, the presently known chemical lasers, do not seem to me to fulfill the basic requirement of a good defense and that is that the defense must be considerably less expensive, must require considerably less effort than the offsetting effort in offense.

HIGH FRONTIER

If we can prove that defense is more powerful than offense, then the rational decision on the part of the Soviets will be to emphasize defense, like us—which already in part they certainly are doing.

I greatly prefer a world where all sides are armed with shields to a world where all sides are armed with swords and no shields. I believe that the emphasis on defense can lessen the inherent probability of war.

I might add that I had the pleasure to participate in the High Frontier effort. I agree fully with that emphasis on defense. I agree with the emphasis on speed. I fully agree with the emphasis on space.

But I could not agree on the technical execution and I have to repeat what Mr. Cooper has said, we need a strong defense. But $100 billion expended on this effort of defense the Soviets would counter by a few billion dollars in offense.

For that reason, having attended the meeting on High Frontier, I most regretfully was unable to sign the final document. I think it is

of the utmost importance that the President's wishes should be carried out which are really hopeful proposals and the elements of his proposal should be built into the final product.

INTERNATIONAL COOPERATION

There is at least one other important point that was brought up in the questioning by the House Armed Services Committee. Should the whole world be protected and is it possible? The answer is "Yes."

I hope that all the nations that have a clearly demonstrated intention to preserve peace and stability will work together and that our main principle in this collaboration is to proceed at as great as possible a speed, using the most new ideas, flexibility and preparedness against all kinds of threats.

The attacker who has to carry the heavier load over a longer distance may well be at a disadvantage. But what the attacker has to do by great expenditure, the defender has to do by ingenuity. We do not have a monopoly on ingenuity. The British have some, the French have some, the Germans have some the Japanese have a lot of it.

The free people all over the world should work together and instead of being secretive about these efforts, we should be as open as possible, we should be as visible as possible, and then I am sure we will be much more effective because most of the critics are people who have spent a limited amount of time in looking into these problems, where some of us in Livermore, Los Alamos and Sandia have spent years on it.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Teller follows:]

PREPARED STATEMENT OF DR. EDWARD TELLER

In the fall of 1939, President Roosevelt received a letter from Einstein stating the possibility that a bomb of unprecedented power could be constructed, exploiting the energy of the atomic nucleus. President Roosevelt promptly called the Director of the Bureau of Standards, and within days, preliminary steps were taken to build a nuclear reactor, a first step in our nuclear development. This occurred shortly after the collapse of Poland under the combined onslaught of Nazis and the Soviets. Among the people who were privy to this highly secret development, by no means all agreed to its feasibility. The leader of the project, General Groves, considered it less likely to succeed than is indicated by the current epithet "Star Wars". One of the most highly placed scientists in the project, James Conant, told me after a briefing in early 1945, "This is the first time that I believe that you really may succeed".

Yet, President Roosevelt's intuition and his faith in some highly competent scientists were obviously justified. President Reagan, in his speech of March 23, proceeded in an incomparably more cautious fashion. Having listened to a variety of evaluations, he proceeded to state with great caution that mutual assured destruction may not remain a feasible form of deterrence in the long run and he challenged scientists to turn the clock back to an era where defense predominated over offense. This is not to be done by undoing what has been accomplished in technology and, in particular, in atomic weapons. One may wish for such a solution, but in fact this is excluded both by common sense and by the elementary laws of firmly established science.

The President's proposal is based on foresight rather than hindsight. It is based on the extensive human experience that whatever fantastic weapons of destruction have been constructed may be countered by the ingenuity of ever progressing technology and science.

It is, of course admitted that the use of defense for deterrence and thereby for the avoidance of war will be an extremely difficult job. Fortunately, our young

scientists have come forward with a number of truly ingenious ideas utilizing the remarkable energy concentrations that can be created in atomic bombs or in lasers which generate light beams, more generally electromagnetic beams that can be of extreme intensity and remarkably well-defined directionality. These are two striking examples, but they don't begin to exhaust the list of candidates for defensive weapons.

It has been quite generally accepted that the only use of atomic weapons is destruction on an enormous scale. The fact is that the energy concentration which one can create even in relatively small atomic weapons can be used to render completely ineffective an enemy weapon engaged in the act of attack, moreover at great distances.

Laser beams produced in very many ways have been used for an incredible variety of purposes, of which the medical use in eye operations, the scientifically precise determination of the distance of the moon, greatly improved systems of communication, and defense against attack including atomic attack are only examples. These examples illustrate that in general peaceful uses, scientific uses, and military uses of the same instruments can hardly be separated from each other. The same physical phenomenon can be and is being adapted for use in all these areas.

Laser weapons have been particularly popular for defense. One should remark, however, that long-wave lasers, though easily produced, are rather ineffective. The shorter the wavelength the greater the military effect, at least as a general rule. Unfortunately, it is also true that these more effective military lasers are significantly harder to create.

There are at least half a dozen basically different approaches to strategic defense, some employing lasers and others not. I considered it a virtual certainty that some of them will work, and will shift the balance of forces back in favor of defense.

As in the case of the atomic bomb, in the new strategic defense proposal, many people doubt the feasibility of such novel action. Two scientists of the highest reputation published a paper in 1968 in which a proof was offered that there can be no defense against an atomic attack. These two scientists now have had to admit that their technical objections have not been conclusive. They still insist, however, that defense, if not impossible, is not the best approach.

Even in five years, defensive approaches may begin to make a real difference. By the turn of the century, new types of defensive weaponry may be supported by 95 percent of our strategic arms budget, with 5 percent devoted to retaliation if all else fails.

It is, of course, true that defense can always be offset or circumvented by more attacking weapons or by novel types of weapons. There is, however, a very real hope that with sufficient ingenuity, we can invent defensive weapons that cannot be offset except by a much greater expenditure and effort on the part of the offense. If such a defense were feasible, it will not be rational for any power to emphasize attack at a time when it is no longer the most effective way to proceed militarily.

If the Soviets in their own interest will have to put most emphasis on defensive weapons, stability will be much more greatly enhanced than by any series of treaties. The consequence would be a genuine detente, not based on treaties that can be circumvented or broken, but one based on technical realities.

The effect of the whole defensive approach will, therefore, be to shift from mutual assured destruction toward mutual assured survival. In general, defense has many intrinsic advantages, recognized for millennia. The attacker has to move more men or material over greater distances. On the other hand, he holds the initiative. Massive expenditures of effort and money is apt to favor the attack. Ingenuity and flexibility will give the advantage to defense.

The strategic defense task is great. For that reason, it should best be shared with our friends and allies who value peace and stability as much as we do. At the same time, the development of the needed new set of ideas will require widespread cooperation and a great deal of popular understanding. For this reason, careful thought should be given to the need for as much open discussion as is ever possible. President Reagan stated his policy not to withhold information from the American people which is already known to the Kremlin. This wise policy has been ignored by all too many bureaucrats.

On March 23, Reagan introduced a new set of ideas to Americans. These ideas he has advocated are apt to have an even greater impact on history than Presi-

dent Roosevelt's secret decision to proceed with the atomic bomb. The new program cannot be carried out without great effort, considerable understanding, and unusual ingenuity. We have a great deal of evidence that in quite a few respects the Soviets are already placing considerable weight on defensive measures to protect their population, both by civil defense and also by acting military measures.

We don't dare to be second best in this technological race. It is directed toward creation of a truly stable peace, and it is apt to have the fundamental consequence that our children and grandchildren will be able to concentrate on active cooperation between nations and will not have to live in the profound insecurity of a balance of terror.

Actions by this Committee in support of research specifically oriented toward strategic defense of the United States proposed by the President could open the door for a better future for all mankind. Farsighted Committee actions in previous years, such as the initiative in favor of short wavelength laser R&D last year, have laid the technical and military foundations for the program which the President has proposed. Further actions in this watershed year would be a critical culmination of many things which this Committee has done for the maintenance of peace and the preservation of freedom.

Senator WARNER. Thank you, Dr. Teller.

There are some questions that I have, but I would like to hear from the other members of the panel.

I would, however, ask your indulgence for about a 4-minute break. This is my sixth hour of chairing a hearing today.

Let us take a stretch for about 3 or 4 minutes.

[Recess.]

Senator WARNER. General Graham, we would like to receive your testimony. I certainly welcome you to the committee. You are no stranger here. You and I have worked together for many, many years. I certainly am a great admirer of your courage and determination in this area.

STATEMENT OF LT. GEN. DANIEL GRAHAM, U.S. ARMY (RETIRED), HIGH FRONTIERS, INC.

General GRAHAM. Thank you, Senator Warner.

I am thankful for the opportunity to present the High Frontier views of strategic defense to your subcommittee.

Senator WARNER. Let me frame what will be most helpful to me.

As you know, I have been present at a number of meetings and have been updated on High Frontier. Let us go to the core of the question, the fact that the Department of Defense has yet not embraced this, shall we say, and what your views are and why it has not.

Those are the tough questions. We can go through a thorough change of pleasantries here, but let us get to the point.

General GRAHAM. First, let me say how much I agree with what Dr. Teller has already said about the historic importance of what the President said. He really is the first of our leaders to take the mutually assured destruction idea on at all.

It is important to note that many of our military people do, as some of the previous witnesses have said, actually reject mutually assured destruction. The fact is that we have been working under those constraints for a long time and it has caused us to go to deal with the Soviets on the basis of trying to maintain a balance in the balance of terror on the one hand.

On the other hand, it has caused my old colleagues in the Pentagon to come forward with deployment schemes for weaponry such as the last two schemes, of how to deploy MX, which seem to have paradoxes within themselves. In those deployment schemes they were constrained to stay with MAD, that is, we would accept the full force of the Soviet first strike and then try to retaliate.

The paradox is that we put essentially a counter force weapon into a mutually assured destruction constrained deployment. Those kinds of problems are based on mutually assured destruction, and mutually assured destruction's corollary tenet that we should never defend ourselves because it is provoking and destabilizing. This is one of the reasons why we have not properly in my view pursued defensive technology.

It is true that the Congress and the administration has put a certain amount of research and development money into Huntsville to look for defensive systems, but given the constraints of MAD, most of that money went out not acquiring strategic defenses, but went to define ways to defend tactical forces against tactical missiles.

I would like to give you one piece of data that I think is very important in this regard. I have taken a rough look at the Soviet expenditures over the past 15 years since we adopted MAD and assume the mutually assured destruction was operative on both sides.

One of the things that shows it was not is the fact that the Soviets have spent about one ruble on defense of their own country against strategic nuclear attack—this counts civil and active measures—for every ruble they put into strategic offense.

While in the United States there is a remarkable difference, we have put $1 into strategic defense of the country for every $10,000 we have put into strategic offense.

This suggests that the Soviets really believe it when they say that mutually assured destruction and its emphasis against defense is "bourgeois naivete". I think the Soviets are right in this case, although I rarely agree with the Soviets.

Now, the problem, of course, seems to boil down to whether or not the technology is available to do what the President says he wants done. Curiously, a lot of the objections to doing what the President has said or objections to High Frontier have come to an incompatible package.

On the one hand people seem to want to reject the defensive system on the grounds that it won't work and then turn around and add objections on the ground that they are afraid it will.

The objections that it won't are technical, of course, and the objections on the grounds that it will work are from those who say,

My goodness, this will be terribly unfair to the Soviets, and somehow the Soviets would be entitled to a presumption that we were preparing to attack them if we were preparing to defend ourselves.

That is specious reasoning. I can tell you from going around the country for a year talking about High Frontier that certainly the average American does not buy the argument that it somehow is more provocative to defend oneself than to threaten to blow the other fellow to smithereens.

Now, this situation, as I sense it, as far as High Frontier is regarded by the administration itself, I think was pretty well spelled out by Mr. Gardner.

They see it as Bambi revisited. Bambi was the nickname given to ballistic missile boost intercept defense, BMBI which became "Bambi."

But I depart from some of the things he said. He said that they have looked at this thoroughly or they at least have looked at it, found that there was no technical feasibility, but found that the original Bambi idea was rejected on the grounds of certain technical problems that have not been overcome.

Our view is that those technical problems have been overcome. Bambi said that in fact within 6 years of the decision to do so and the document laid out a quarter-by-quarter program as to how one would go about getting such a system, you could have a kinetic-energy-kill ballistic missile defense 90 percent effective against a bigger threat than is actually in existence as of today.

That was a postulated salvo of 2,000 long-range Soviet ballistic missiles, a threat that we may someday, but we are not facing right now.

They further said that such a system could be had for $30 billion, but those, of course, were the 1962 dollars.

There were two problems in adopting Bambi or vigorously pursuing the concept. One was indeed technical and cost and the other was the fact we were sliding into the mutually assured destruction idea with its bias against strategic defense. At the time the decision was made to do nothing more about it.

TECHNICAL AND COST PROBLEMS

Let me talk about the technical and cost problems because they are the ones that seem to bother my old colleagues in the Pentagon these days.

In 1962 our computers were still using cathodes and diodes and, as many a television commercial says, it would take a room this big to hold the computer that today you can put in your pocket, or at least in a breadbox.

So, in order to do what we say can be done in the High Frontier kinetic energy kill system, you would have had to have a very large satellite. In fact, they ran up as heavy as 58,000 pounds.

We say that because of miniaturization and the advance in computer capability, we can get a 5,500-pound satellite up that will do the same work.

The other problem is that in those days the space transportation system capable of putting up such a space defense was the Saturn booster, not a very cost-effective transportation system, although a very effective one.

Witness our landing on the Moon. But those two things combined meant that the expense of putting up a defense in space in those days was tremendous.

Further, in those days we didn't know how long we could keep a satellite in orbrit. The mean time to failure, that is, how long a defensive satellite would probably last in space, was only 18 months.

Today we know when we put satellites up that many of them last a very long time and as a matter of fact, we believe that the defensive

satellites that could be put into orbit today would last 5 years or more, the mean time to failure would be 5 years or more, so that replacement of those satellites would not be a backbreaking load for the budget.

Our basic view of what has happened in the Pentagon is that there has been a gradual movement in the direction of what we are saying and we appreciate that. Early on a very quick and dirty analysis came up with the notion that it would cost $300 billion to put up a satellite system that we talk about today in High Frontier.

We have in our possession at High Frontier an estimate sent over by Mr. Carlucci that says that we are still too low with our $15 billion and that it will cost $50 billion.

Well, that is quite a long step in our direction, and we appreciate that. For a while there were arguments that there was something technically infeasible about what we were talking about, but as Dr. John Gardner's testimony indicates, there are no real technical show stoppers to doing what High Frontier says should be done.

I think that you have a problem, and I don't want to be perjorative about this in any way, but the fact of the matter is if you consider the possibility of a good defense is not a perfect defense—mind you, looking for perfect defense is the absolute end of any defense effort at all because none are ever perfect—but if we can get a pretty good defense which will add a great deal to our deterrent capability in the near term, it begins to conflict with other programs.

So long as you talk about the 21st century you are not going to get into any conflict with ongoing programs. But if you start coming in as close in as High Frontier says you can, provided you cut through a lot of redtape, not only in the Pentagon, but in this building or up here on the Hill, if you will cut through that redtape, you can get it rather quickly.

We are certain you can get a space borne defense before the end of this decade. If you can do that, then a whole lot of other current military programs and even political programs and arms control policies, and so forth, become unnecessary.

I think this is our main problem within the administration these days. I don't think it is the problem of the President. I don't think it is the problem of the Secretary of Defense. But I do think that that is an essential difficulty which we have in selling this program.

What I hope is that as ways and means are looked at to do what the President said he wants to do, that there will be increasing willingness to look at the more simple technologies that can be had more quickly.

I sent a letter to General Vessey, the Chairman of the Joint Chiefs, congratulating the Joint Chiefs for giving the President the advice given to him which I am certain, as he said in his speech on the 23d, was the thing that caused him to make this decision.

General Vessey wrote back to me and said,

DEAR DAN: I appreciate your views on the President's strategic defense initiative. As you have been saying for some time, it is the sensible way to go.

I think it is the sensible way to go. I don't think it is going to require the 21st century.

The only point of difference I would have with my old good friend, Ed Teller, is that I don't think you need so much scientific breakthrough as you need engineering ingenuity to use the technologies already available to us to get an acceptable and enormously valuable

defense in space, one that protects not only our retaliatory capability, but also protects the cities and the people of the United States for the first time since the advent of the long-range ballistic missile in the Soviet Union.

Senator WARNER. Where do the llies fit into this picture?

General GRAHAM. I agree with Dr. Teller that in fact—well, I guess I disgree with him a little but. I don't believe that you can put up, at least in the near term, a defense of the United States that does not at the same time defend our allies from long-range ballistic missiles.

Since that is the case, the United States should have the right and if they are smart, will have the mission of telling the Japanese, for instance, "Look, since this system will defend you and it is perfectly acceptable to your constitution, then you should help fund this effort."

Now whether that will work in Europe or whether it will in fact turn out to be a tradeoff with other things that we do that for which we would ask them to pick up the tab. This would make it less of a burden to field the mutual defense and I think that we would be thoroughly justified, as my own discussions with Japanese governmental leaders suggest, that they would be ready to do it, at least in Japan.

Senator WARNER. In other words, could you put up a system just to protect the United States and then you add on increments to protect the rest of the world or is it intrinsically designed to protect the whole world?

General GRAHAM. The system we propose would intrinsically protect the whole world because in order to keep that threat volume of air and space through which the Soviet threat comes when aimed at us, you also are covering all the territory; for example, cover China or Libya which might be rather important someday, and you have a lot of the satellites that are over the South Pacific.

You can't get the world to hold still from whirling around underneath the satellites. So when you put up a capable defense of the sort that High Frontier proposes it automatically defends allies. The only way you could not defend your allies would be to instruct your system not to do it.

What you need is the simplest possible system which, when it sees a lot of missiles rise, doesn't care whether they came from a submarine or whether they came from a mobile launcher or whether they are headed for Japan and/or Europe. It takes down anything it can strike.

That is the simple straightforward way to do it. You have to get more and more complicated in order to rule out defense of folks other than ourselves.

Senator WARNER. So we really become world policemen then?

General GRAHAM. I think one of the things we would do is introduce a new kind of new cement in our current alliances.

Furthermore, we would make some of our bilateral alliances, such as the one we have with Japan, into true global alliances because we would all be dependent on the same global system.

Senator WARNER. We have to build in two countries, say in the Middle East, modest capability, we did not want to get involved in it, the system does not react to that?

General GRAHAM. That is right. We can, if we want to, leave it alone. There are folks who actually believe there is a danger of a general going crazy and pushing a button on the missiles. It is rather annoying to me. It is never a Russian general; it is an American general who goes crazy and pushes the bottom.

For those who believe in the accidental war scenario or madman scenario, the kind of system that would be in space at the time would in fact be able to intercept even our own missiles if we decided to do that, if the Dr. Strangelove scenario is a reality.

Senator WARNER. There are certainly a lot of international implications in the system. I regret my colleagues in the Senate earlier did not bring in more depth.

[The prepared statement of General Graham is as follows:]

PREPARED STATEMENT OF LT. GEN. DANIEL O. GRAHAM, USA (RET.)

Senator Warner, I am thankful for this opportunity to present the High Frontier views of strategic defense to this subcommittee. This testimony represents the views of over a score of scientists, engineers, and strategists who worked on Project High Frontier.

I should like to address this issue, first, from the point of view of strategy and, second, technology.

The President, in his speech of 23 March this year, made the first real break with the failed strategy of Mutual Assured Destruction when he called for strategic defense of the United States. When the President posed the question: "Is it not better to save lives than to avenge them?" he was not only putting our approach to national security on a higher moral plane, he was making eminently good military sense.

Some people have insisted that MAD has worked since its inception in the mid-sixties citing the fact that up to now there has been no nuclear war. This is not true. Such people confuse deterrence with MAD. Deterrence has worked; MAD has not. In fact, the world has moved closer to a nuclear holocaust since the inception of MAD. This is amply evident in the support for desperate solutions to the nuclear dilemma such as "nuclear freeze" and unilateral disarmament. It is also evident in expensive and controversial proposals for deployment of new srategic systems constrained to conform with the all-offense, no defense constructs of the MAD doctrine.

MAD and deterrence are not synonymous. MAD insists that only offensive nuclear weapons can provide deterrence and that defensive weapons are provocative and destabilizing. MAD ignores, to our ultimate peril, the deterrent value of defensive weapons. It is this mind-set against defensive weapons which must be overcome.

The objections to strategic defense are shared by members of curious tacit alliance. On the one hand, disarmament enthusiasts cling to the offense-only tenets of MAD, using the oft-repeated slogans "There Is No Defense," "There Should Be No Defense." On the other hand, the big-bang, offense-only school of thought clings to MAD because strategic defensive systems would check the urge for ever more, ever better offensive weaponry and create a competition for defense dollars.

Those who say that strategic defenses are destabilizing and provocate curiously find this true only of U.S. strategic defenses. The Soviets, who rejected the no-defense doctrine of MAD with contempt as "bourgeois naivete" have spent over the past 15 years, about one ruble on defense of their country against nuclear attack for every ruble spent on nuclear attack systems. The United States during the same period has spent one dollar on defense of the nation for every $10,000 on offensive weapon. Yet it is not argued that the Soviets can be judged to be preparing for attack against us. But should we deploy a defensive system, it is argued, the Soviets would be justified in assuming an intent to launch a first strike—curious reasoning indeed.

Strategic defenses should be addressed first and foremost from their contribution to deterrence. A pretty good strategic defense can do far more for deterrence than a few more offensive missiles no matter how cleverly the latter are deployed.

Deterrence is, after all, essentially a function of uncertainty in the mind of the attacker as to the results of his attack. If the Soviet marshals had to calculate on the random loss of 50 percent of their missiles to a U.S. defense, they could have no confidence whatever in the results of a disarming first strike. Adding more missiles to their inventories would not restore confidence.

This reality is often overlooked by analysts of defensive systems. Instead of concentrating on the deterrent value of such defenses, they look for a perfect defense that would prevent a retaliatory strike. The latter kind of defense is technically and fiscally out of the question and indeed could be considered a provocative prelude to a first strike or an ultimatum.

If we look at strategic defenses with common sense, demanding no more of them than we have of offensive nuclear weapons—that is, reliable deterrence—we will find that the technology is available at reasonable cost to defend our cities and our deterrent forces before this decade is out.

THE MX AND STRATEGIC SURVIVAL: THE VIEW FROM THE HIGH FRONTIER

It is a military fact of life that a combination of advanced technologies has rendered America's land-based deterrent missile force vulnerable to a Soviet first strike that would expend only about 25 percent of the ICBMs housed in Soviet silos. This vulnerability is very destabilizing, and poses a temptation for the Soviets to take both preemptive actions, and dangerous risks of nuclear "brinksmanship." It is this vulnerability which, in the main, underpins Soviet claims of military superiority and provides a disincentive for them to engage in meaningful, balanced arms control. Because of this vulnerability, and the limitations it places on us to respond to Soviet aggressiveness in a controlled, limited way, the Soviets reject our attempts at changing our strategic doctrine (such as PD 59), because we simply would not have the means of carrying it out. This "window of vulnerability" must be closed without delay.

In pursuit of this goal, the President's Commission on Strategic Forces was formed. Its mission was two-fold. First, to find an acceptable basing mode for the MX, which is the only readily available replacement for our aging and relatively inaccurate ICBM force. Second, to make recommendations as to what strategy should be followed in the forseeable future for the long-term deterrence of Soviet nuclear aggression. In this last assignment, it should be mentioned that President Reagan has made public statements to the effect that we should break away from the menacing doctrine of Mutual Assured Destruction (MAD), which this nation has followed for the last 20 years. It can be demonstrated that it has been this poor strategy of a lack of balance between strategic offensive and defensive forces (virtually "all offense" and NO defense) that has gotten us into our present condition of strategic vulnerability. The basic problem to solve, then, is the problem of poor strategy. If deterrence fails, MAD leaves only a retaliatory attack that amounts to national suicide with vanishingly little or no hope of survival. This must be changed to a strategy that assures the survival of the United States as a free nation and its people as human beings: we call this strategy "Assured Survival."

The Commission's report makes the following recommendations:

(1) Initiate research and development on a new, small, single warhead ICBM for mobile deployment in the 1990s.

(2) Continue research and development on superhardened silos.

(3) Deploy about 100 MX missiles in existing "Minuteman" silos.

(4) "Vigorous" R&D on ballistic missile defense.

While the small, mobile missile makes some military sense, it would be 10 years or more before it reached Initial Operational Capability (IOC), which does not address the problem of closing the "window of vulnerability" in a timely fashion. Also, it does not move us from MAD to some strategy that gives some degree of hope of (should deterrence fail) surviving a nuclear attack. In this way, it is a tacit endorsement of the principles of MAD.

Superhardening (which we've never done before) is straight out of the MAD philosophy of passive defense of strategic systems, but no survival of the nation should deterrence fail. Besides the fact that it is new technology (based on ⅛ scale tests that may be up-scaleable), it could easily fall prey to recent, known advances in guidance techniques.

Some have suggested a form of Multiple Protective Shelter (MPS) or Multiple Aim Point (MAP) system . . . both are really the same basic idea of pouring ever

more concrete into passive protection of strategic systems by multiplying the number and difficulty of targets. Both depend on the "European Shell Game" concept of mobile shuffling of ICBM "peas" among multiple shelters to confuse the attackers. The most optimistic estimates of "austere" MPS systems indicate five to seven years to build at a cost of $12 billion to $20 billion, in 1980 dollars. Unfortunately, the Soviets have demonstrated their ability to construct over 200 ICBMs in a single year, each carrying from 4 to 10 MIRV warheads.

Basically, no "concrete intensive" solution can meet the twin requirements closing the "window of vulnerability" and changing U.S. strategy from its present MADness to one of Assured Survival.

HIGH FRONTIER'S ANSWER FOR "MX"

The High Frontier concept of reestablishing balance between strategic offensive and defensive systems (see High Frontier: A New National Strategy, Washington, D.C.: High Frontier, Inc., 1982) is basically independent of the argument over deployment or non-deployment of the MX missile. While it might be argued that effective strategic defenses would obviate the necessity for upgrading U.S. strategic offensive weaponry, the High Frontier team found otherwise. High Frontier insists that its military recommendations for deploying a purely defensive strategic system represent no panacea for solving all strategic problems. The United States must NOT exchange the present "all offense" strategy for an "all defense" strategy, since it was unbalanced strategy that got us into our present vulnerability to start with.

High Frontier has recommended deployment of both MX and the B–1 bomber. However, the acquisition of these systems was not supported on the grounds that they would close the "window of vulnerability" or even that they would do much to reverse the adverse trends in the balance of strategic military power. Rather, they were recommended on the pragmatic grounds that they were needed to replace aging components of the U.S. deterrent force.

High Frontier offers the most efficient, least costly, and most politically acceptable solution to both the MX deployment controversy now raging in Washington, and the larger and even more important question of how to frame our future strategic doctrine. Stated simply, acceptance of the High Frontier strategic thrust would permit, early on, a cheap and effective non-nuclear defense of individual silos long enough to permit launch of their ICBMs, be they "Minuteman" or MX. Such a defensive system would put as much or more uncertainty into the mind of a Soviet planner as any passive system (superhardening, multiple shelter, or mobility) yet proposed. Here is where the final recommendation of the President's Commission on Strategic Forces can be built upon. The MX can be deployed in current "Minuteman" silos and protected against any rational Soviet first strike.

The strategy recommendation of High Frontier succinctly stated is this: Move from the "all offense," punitive deterrence doctrine of Mutual Assured Destruction to a balanced offense-defense strategy of Assured Survival which deters by eliminating a nuclear first strike, either countervalue or counterforce, as a viable military option.

The broad technological rationale underpinning this strategy recommendation is this: The key assumption of current and previous U.S. doctrine, that nuclear weapons had created a near absolute dominance of offense over defense, is no longer valid. The assumption that strategic defenses could always be rendered ineffective by the offense was never universally accepted by military thinkers—but U.S. actions over the past 15 years or so prove conclusively that it was key to our policy. We abandoned older strategic defenses and neglected development of new ones, declaring in some quarters that strategic defenses were in fact dangerous and destabilizing. We strove mainly to maintain a balance-of-terror in offensive systems while negotiating with the Soviets to keep that balance within agreed bounds.

High Frontier's basic strategy recommendation creates an unavoidable clash with strategic weaponry recommendations which have been constrained to stay in line with the MAD doctrine. Options such as MPS (Racetrack), Minuteman III/MAP, and CSB/Dense Pack are obvious examples. They represent attempts to correct strategic imbalance within the "offense only," punitive second strike constructs of the Mutual Assured Destruction doctrine. Such deployment schemes give short shrift to active defense of the missiles while pouring many billions

into passive defenses such as reinforced concrete, deceptive basing, and launcher mobility.

The fact that the MX was designed as a counterforce weapon capable of limiting damage to the United States by destroying the most dangerous of Soviet missiles before launch is proof of the military professional's desire to escape the countervalue or city-busting imperative of MAD. But the deployment systems put forward by the Pentagon demonstrate clearly that MAD prevails no matter what the military men think of it. Both "Race Track" and "Dense Pack" are deployments designed to absorb the effects of the very Soviet weapons MX was designed to attack before launch. This paradox evokes a hard question . . . reasonable from pro-defense quarters and cynical from other quarters: What is it about MX deployed in this way that deters a Soviet first strike? Is it the destruction of the silos from which the first strike was launched or is it the additional killing power against cities and population? That is a tough question to answer satisfactorily even though there is some merit in attacking empty silos that can be rapidly reloaded and refired and attacking the impressively hardened Soviet political and military command and control system.

Since the MX deployment schemes thus far advanced are rooted in continued adherence to the MAD doctrine and High Frontier's main objective is to escape the strategic bondage of that doctrine, it should come as no surprise that they are mutually incompatible.

The High Frontier strategy of Assured Survival requires that three military requirements be met:

1. A quickly-deployable spaceborne defense against Soviet strategic missiles in the boost/post boost phases of trajectory.
2. A second-generation spaceborne system capable of intercept of Soviet missiles and RVs throughout their trajectories in space.
3. A limited-mission, quickly deployable, ground-based point defense of individual missile silos.

The High Frontier study describes in some detail three technological options for meeting these requirements. These weapon systems were put forward by High Frontier to prove that the requirements could be met, not to promote any single technical solution. Briefly stated, the spaceborne elements of the strategic defenses are these:

The first spaceborne requirement can be met by a kinetic-energy kill system consisting of numerous (432) satellites orbiting at about 300 miles altitude, each armed with 40–50 intercept devices similar to (but much less complicated than) the Vought ASAT vehicle. The engagement scenario consists of detection of a Soviet missile salvo, real-time exchange of data among satellites, computation of intercept points, interceptor sensing of targets, and limited maneuver prior to impact. Sensing technology described in the study is infra-red, but might be radar or ultra-violet. The system is designed to operate autonomously with command override of the total system, not of components, and it is designed to intercept attacking missiles while still in their boost phase (before they deploy their warheads), when infra-red sensing of the hot exhausts is most efficient. Questions about countermeasures to this system were answered 20 years ago in the now declassified "Project Defender" study. Basically, there are no credible countermeasures readily available to the Soviets.

High Frontier visualizes two options for the second-generation system depending upon rate of technological advance. One is the improvement of sensors to make cold object sensing compatible with a mean time to failure of satellites of five-years or more. In this case, GBMD I could be simply upgraded as the original satellites failed over time and were replaced with more capable ones. The other option is dependent on solutions to problems of directed-energy beam weaponry which could result in an entirely new class of system. In either case GBMD I and II would have to be designed for C^{3}I compatability. Here is where "vigorous" R&D into ballistic missile defense, when added to production and deployment of existing technology will pay dividends.

The ground-based layer of defense is most pertinent to the current MX deployment controversy. The inclusion of the point defense requirement in the High Frontier study was a function of time requirements for acquisition of the spaceborne systems. A spaceborne system with a kill probability of 50 percent or better would in itself remove for practical purposes concern for the vulnerability of land-based missiles, but such a capability, under the best of conditions was not likely to be achieved in less than 5–6 years. Therefore a quick-fix to missile vulnerability was a necessary first step in the new strategic direction.

The system described in our study to meet this requirement is Swarmjet. However, we now believe that rapid fire guns will prove to be more readily available and perhaps cheaper. Both could accomplish the very limited capabilities required by the High Frontier ground-based defensive element. It is important to note these carefully as they are radically different from those which have driven ABM concepts in the past:

1. The system must defend one silo and one silo only; it does not defend neighboring silos, installations, or areas.
2. The system must ignore all RVs except those that will in fact kill the defended silo.
3. The system must be able to defend against current real threats, but not against future Soviet countermeasures.
4. The system must defend against only the first two or three arriving and accurate RVs and expect to succumb to saturation thereafter, having provided the defended missile with a good chance of launch.
5. The system must be non-nuclear requiring no release authority.
6. The system must use radars simple and cheap enough to be lost to non-attacked RVs, e.g., SLMB attack.

The basic scheme of such a point defense is an installation clustered as closely about a "Minuteman" silo as the inherent hardness will allow. This installation includes the innards of the radar and fire control systems and the firing element, whether "Swarmjet" or guns, hardened to the same degree as the silo it is protecting. Range-only radars are deployed up-range of the site, toward the direction from which would come the Soviet first strike, to maintain surveillance of the limited threat cone for the single silo site. When any object with the characteristics of a Soviet RV enters that cone, a cloud of kinetic energy kill projectiles ("Swarmjet" missiles or 30mm API rounds) are fired to meet the RV at the keep-out distance necessary to prevent destruction of the missile silo, even if the RV is salvage-fused to detonate when hit. This keep-out distance is about one kilometer slant range for current Soviet MIRV warheads (all of which are less than 10 megatons), assuming the weakest "Minuteman" silos are only 1,500 PSI.

The individual radars' antennas are slaved to the central unit and each has redundant "pop-up" antennas ready should an inaccurate or salvage-fused RV destroy them. The same redundancy is used for the exposed firing element, since that same salvage-fused RV would take out an exposed gun turret or "Swarmjet" launcher on detonation. It has been determined that three "Swarmjet" launchers or three pairs of guns would enable a silo to be protected from up to three salvage-fused Soviet RVs. This would allow several launch windows between exploding (salvage-fused) RVs(the Soviets must wait for the turbulent atmosphere to calm down before another warhead comes in), during which time the ICBM in the defended silo may be launched, without the necessity of such "hair trigger" expedients as "Launch on Warning." If Soviet RVs are NOT salvage-fused, however, the gun system (for example) can protect the silo site against up to 27 Soviet RVs.

Some critics have raised the question of effectiveness, in answer to which the gun system will be used as an example. The U.S. Air Force conducted tests using the same GAU–8/A 30mm cannon as in the EX–83 turret against stationary ICBM warheads with inert material in place of the nuclear systems. They found that only one of the depleted uranium core Armor Piercing-Incendiary (API) rounds was needed to absolutely tear apart an RV. They also discovered that such an impact would set off a warhead if salvage-fused. This means that all this gun has to do is hit the Soviet RV with just one round in order to accomplish its defensive mission.

The General Electric Company (which produces the GAU–8/A for the Air Force's A–10 attack plane and has developed the EX–83 for anti-cruise missile use) did a study for the Army's Ballistic Missile Defense unit at Huntsville in October of 1982. This study showed that just one EX–83 had a 64 percent chance of hitting the most difficult RV target at 3,000 feet, from a more disadvantageous position than invisioned in the High Frontier concept. By placing the guns in the way High Frontier proposes, and engaging with pairs of guns rather than singly, the probability of destroying a Soviet RV before it gets within one kilometer is over 85 percent! If the scoffers still have doubts, it should take the Pentagon no more than 60 days to set up a test at Johnston Island using actual radars, guns, and nuclearly-inert incoming ICBM warheads, and the cost would be mini-

mal. This type of system is quickly deployable . . . in fact, silos can be defended in less time than MX can be deployed in them. The cost of this defense is cheap: under $10 million per silo or $1 billion to protect 100 ICBMs. In fact, we could use this system to protect all 1,000 "Minuteman" silos for a cost that would be competitive with that for protecting 100 missiles using CSB/Dense Pack.

It must be emphasized, however, that the point defense is not the complete answer. When it is first deployed, it is the "quick fix" to the vulnerability problem, until the first generation spaceborne defense is in place. It is vulnerable to being overwhelmed without the timely deployment of the spaceborne system. With the spaceborne system in place, the "window of vulnerability" has been locked, in that the spaceborne system rules out both counterforce and countervalue first strikes (and protects our population, for a change), and the point defense becomes the second layer "backstop" for RVs that may leak through the spaceborne system.

In conclusion

Discussions during our presentations of High Frontier suggest that there is broad recognition of the fact that there can be no optimum survivability for MX, or any other offensive forces, without an appropriate mix of active and passive measures where technology and cost permit. We think that the omission of any active defense element in past MX survivability proposals was a factor in their lack of credibility. We are also convinced that an appropriate combination of active and passive measures should be less costly and more effective than any conceivable solely passive measures.

The immediately available options for closing the "window of vulnerability" in a timely fashion boil down to:

1. MPS/Race Track at $33 billion for 200 ICBMs protected or $16.5 billion for 100 ICBMs and five or more years to implement.
2. "Austere" map at $12 billion and five or more years to implement.
3. Superhardening such as CSB/Dense Pack at $9 billion and five or more years to implement.
4. The High Frontier proposal for point defense at $1 billion and three years or less to implement.

As demonstrated, none of the first three options is very viable, all are extremely costly, and the first two suffer from fatal political liabilities. Consider that for $16.5 billion that we might spend for MPS/Race Track we could get both the High Frontier point defense and the first generation spaceborne defense, with a High Performance Spaceplane thrown in as a bonus! Additionally, we break away from the brooding menace of Mutual Assured Destruction.

High Frontier stands forth as the most viable and fiscally responsible answer to both questions posed to the President's Commission. Ask yourself this question: Isn't Assured Survival better than Mutual Assured Destruction?

Senator WARNER. Dr. Garwin, you have been the most patient of all. We will now proceed to hear from Dr. Garwin.

STATEMENT OF DR. RICHARD GARWIN, IBM FELLOW, THOMAS J. WATSON RESEARCH CENTER

Dr. GARWIN. Thank you.

As in the testimony I submitted for the postponed hearing on April 6, these are my own personal views.

The problem is with the necessary leak-tightness of ballistic missile defense that is going to defend populations. I agree with General Graham we could and we should develop and deploy a very limited defense of silos. We could do that very soon. The Defense Department has never demonstrated the feasibility of it, in fact they have tried hard to stay away from it. We ought to do that within the limits of the ABM Treaty which is initially 100 silos defended, and we can.

What is important really shows up in the scenarios of the Soviets attacking the Minuteman and then threatening the United States—

that unless we concede, they will destroy our cities. The ability to destroy silos is not deterrence; the threat to destroy cities is the essence of deterrence on both sides. That is the threat with which we have to reckon. That is why President Reagan demanded absolute protection.

That was amplified by the Secretary of Defense in his "Meet the Press" interview on March 27 when he said he had no doubt that we could achieve a perfect defense against nuclear-armed ballistic missiles, and later on he also added against nuclear-armed cruise missiles.

So, whereas I fully support working on such defensive technologies—and I have worked on them and supported working on them since the 1950's—I do regret that the President made this statement rejecting deterrence by threat of retaliation, which he notes has worked.

DON'T ABANDON DETERRENCE BY THREAT OF RETALIATION

It is not deterrence by defense which has worked all these decades; it is deterrence by threat of retaliation which has worked. Demanding a perfect defense, as was stated earlier, "because it is better to protect people, to save people's lives than to avenge their lives" should not replace deterrence unless we are quite sure that such defense is at hand.

Unlike other Presidential decisions which one might support for their audaciousness like the decision to go to the Moon, this one could have very substantial regrets. Had we tried to go to the Moon and failed, we could have made a black eye. But if we try to build a perfect defense and fail, we may have a smoking ruin of a nation because it is not the Moon which fights back; in this case it is the Soviet Union.

Imagine what we would do if the head of the defense forces of the Soviet Union said that he had no doubt that they could have a perfect defense against our nuclear weapons and can negate them and make them impotent.

We would go back to the struggle in which we engaged 10 and 20 years ago when we just thought there might be some kind of ballistic missile defense on the other side. We scrambled to build more weapons, to multiply our warheads in the MIRV deployment, and so on, which is universally regretted by everyone on our side because those MIRV's have come back on the Soviet side to threaten our own deterrent force.

BOOST-PHASE ABM ATTRACTIVE BUT DIFFICULT

Of course, there is an attractiveness and appeal to boost-phase ABM—the more so since MIRV has been introduced—because the targets are fewer, they are softer, easy to destroy and easy to see. All three combine to make space-based ABM more attractive and one has a longer time to assess the remaining threat so that a layered system is easier to do.

But how to achieve this boost-phase ABM? A year ago Senator Wallop sent a "Dear Colleagues" letter advocating 10-megawatt/10-meter minimirror laser BMD, and indicated that 24 of them could handle 500 or 1,000 Soviet ICBM's launched within 2 minutes. As I remember, nobody on this panel and nobody that I have heard today, nobody who favors the President's program suggests that that is an effective system.

It is not an effective system. It would not do the job; but more important it is vulnerable. I think Dr. Teller has repeated today what he said in other interviews, as has his colleague Lowell Wood, that weapons based on satellites are large, costly weapons and too vulnerable, and they can be defeated for a small fraction of the investment.

POPUP SYSTEMS NEEDED BUT PROBLEMATICAL

Therefore, you don't want to even start deploying defensive weapons on satellies. The alternative is a popup system, and there the problem is the Earth is impenetrable to the kind of weapons that we have thought of, even Dr. Teller's young colleagues have thought of, which would also be effective against boost-phase missiles.

The problem is a simple one. If this is the Earth and over here is the Soviet ICBM launch 6,000 miles away, that happens to be one quarter of the way around the Earth.

We want to defend against these missiles in boost phase. They only rise a couple hundred miles in boost phase, barely perceptible. We would have to popup from over here 3,000 miles to be able to see those missiles or direct our line-of-sight weapons against them.

Of course, if the Soviet Union would allow us to deploy our ballistic missile defenses on their territory, we would have a much better chance. But that is the kind of arms control agreement which I don't look forward to negotiating.

Furthermore, there are counters even to popup systems. For instance, the side which launches first can include, if they have the same kind of technology—and the Secretary of Defense and even the President have suggested that we might give them this technology in case they don't get it themselves—what is to keep them from putting some of these X-ray lasers or whatever they are on their own ICBM boosters mixed in?

They know when they are going to fire; and then they can shoot our weapons as soon as they climb up over the horizon and before they get high enough to see their real ICBM in boost phase. That is only the beginning of the countermeasures that the Soviets will think of as we try to think of defensive systems.

SOVIET X-RAY LASERS COULD COUNTER OURS

Imagine our response if the Soviet Union has the capability that we seek. We would be finding other ways to threaten their destruction, because a threat to destroy the other side is a general purpose deterrence.

That is why we don't struggle to get an ultimate biological weapon capability—because we already have a way to destroy any nation that we need to destroy. Even if both sides have a perfect defense which in test is shown to be flawless, how confident are we that some spy, some jamming system, some means could not be found to negate our defensive system; and when the Soviet Union is confident, that they could do that then they could launch a first strike?

My conclusion is that because of the vast destructive power of nuclear weapons against populations and industry, there is no de-

fense in sight which cannot be more readily countered by the Soviet Union by the use of some of these modern technologies that we are talking about here.

As for the utility of ballistic missile defense against third powers or against accidental launch, there are easier ways of achieving that.

If it is accidental launch of our weapons that we are talking about, well, we could equip our warheads easily, at low cost and very soon, with a capability to disarm them in flight by an absolutely cryptographic signal.

So if 1 or 2 or 1,000 or 50 missiles get loose accidentally and we don't want them to explode, we send them the signal and they will land, but they will not in fact blow up.

ABM TREATY VITAL TO U.S. SECURITY

I recommend that we recognize the importance to our security of continuing the ABM Treaty in force and that we recognize the urgency of negotiating a ban on space weapons and on destruction or damage of satellites.

I agree with Dr. Teller about the value of space capability to our military posture ranging from warning satellites to treaty verification to just plain old observation, as General Graham said, "to look into the closed society of the Soviet Union."

ASAT BAN IS DESIRABLE

Now, regarding the potential ASAT Treaty, we should write one that satisfies us. Of course, it must ban weapons in space, destruction or damage to satellites. We must add a ban on test of antisatellite activity including ground-based ASAT or air-based ASAT such as the one the United States is proposing to build.

The Soviet Union antisatellite vehicle has been tested only in low Earth orbit and works only half the time. We can allow that to remain in being in exchange for allowing our F–15-based ASAT to come into existence untested.

Now, I agree with Dr. Teller that we prefer not to deploy weapons in space and I believe it is extremely important, therefore, to get the benefit of an ASAT treaty to keep the Soviet Union from deploying weapons in space and from threatening our satellites with the general purpose capability of a space mine, which is a problem with all these satellite deployed systems.

The same high technology which makes the interceptor go from 58,000 to 5,500 pounds in 1983, makes a space mine which would be 1,000 pounds in the old days perhaps weigh only a few pounds. Unless one has millions, in my opinion, of decoys and interceptor satellites in space, each one of them can more readily be spaced mined at a lower cost than it can be put into space in the first place.

Now, "Is it not better to save lives than to avenge them?" is absolutely right. That is the essence of deterrence. It is not that on the one hand we are hoping to save almost all of the 100 million lives which would be lost in nuclear war.

SAVE ALL LIVES BY DETERRING NUCLEAR WAR

We are hoping to save every single one of them by deterring the occurrence of nuclear war. There are many kinds of deterrence, General Graham is exactly right; the kind we have had and which has worked as deterrent is by means of the threat of retaliation.

He is wrong, however, in saying that we spent only $1 on defense for every $10,000 on offensive weapons. The Safeguard system was almost $10 billion. We spent almost a billion dollars a year on ABM research and development.

So, something between $1 on defense for every $20 and $1 for every $100 on offensive weapons would be a more correct statement—certainly much less than the Soviets spent. We don't believe the Soviets are preparing for attack against us just because they are building defenses, because we have assured ourselves that we can penetrate their defenses.

So, I am pleased to see them spending money on defense which will not be effective against our own forces.

Now, one problem is that the President really is asking for a perfect defense. If that is not what he is asking for, he has deluded the Secretary of Defense, which I regard as unfortunate.

Professor Teller has taken a very relaxed view that the President is asking—and if you read his words, that is exactly what they say—for a road map to define a research and development program for an effective defense which would come into being in the long term, no doubt beyond the beginning of the next century.

But that is a perfect defense he seeks—one which will let people breath free of the threat of destruction. General Graham rightly says that that kind of defense is unattainable and he proposes instead another kind.

I agree with him in the beginning that we ought to develop and deploy some of these defenses of Minuteman.

Because the Soviets have many thousands of strategic warheads and they have the flexibility of retargeting them to eliminate the targets which are least important to them in this deterrence or destruction of the United States, I do not believe that a reasonable defense such as advocated by General Graham could be considered as satisfying the request of the President.

If there are any questions, I will be glad to do my part in answering them. I will submit my statement for the record.

[The prepared statement of Dr. Richard Garwin follows:]

PREPARED STATEMENT OF RICHARD L. GARWIN, IBM THOMAS J. WATSON RESEARCH CENTER

Senator Warner, Thank you for the invitation to present testimony to your hearing on the MX * * *.

I note that I speak for myself alone, and these views should not be regarded as those of the IBM Corporation or of any other group with which I am associated. In addition to the general experience related in the Biography, I have worked since 1952 on ballistic missiles, defense against ballistic missiles, and arms control. In recent years, I have consulted technically and done studies for the Defense Department, for the White House, and for other agencies of the government in both Carter and Reagan Administrations. On January 27, 1983, I testified to the Commission on Strategic Forces.

My present comments on the MX deal specifically with what U.S. programs should be, in the light of the recommendations of the Commission on Strategic Forces.

I agree with most of the analysis and most of the recommended programs following from the analysis of the CSF:

Minuteman vulnerability is not of major importance so long as the overall strategic force is not vulnerable.

A small ICBM (Midgetman) is a desirable direction for the strategic force, whether we have an unbridled arms race with the Soviet Union or we seek and achieve major reductions.

The submarine-launched ballistic missiles (SLBM) on large submarines are at present an invulnerable and enduring component of the strategic forces. For the future, we should have the option of basing strategic weapons on small submarines, and development of such small vehicles for SLBMs should begin soon.

Strategic arms control negotiations will serve the national security better if they are more specifically oriented toward a limitation on numbers of warheads than if they are directed toward a reduction in number of launchers, and there are feasible approaches to seek such a reorientation while attending unilaterally to our own security needs.

I disagree with the Commission on Strategic Forces in their recommendation for a program which is simply grafted onto their analysis and which in no sense follows from it—the recommendation to complete development and to deploy 100 MX missiles in Minuteman silos. I disagree because our own objective security needs can be met better without the MX, and because the concept of MX as a bargaining chip (if one accepts that objective) is better served by a less costly and nearer-term program to upgrade the accuracy of the Minuteman-III missiles and of the Trident-I.

In 1979, I was arguing that to redress the "imbalance" in "time-urgent hard-target kill capability" expected at the expiration of SALT II in 1985, one could and should improve Minuteman accuracy and the accuracy of the Trident-I missiles in part by use of the ground beacon system, GBS, or the Navstar satellite system). Having studied these matters, I was confident of this conclusion, but because others were not persuaded, I obtained from the Under Secretary of Defense (Dr. W. J. Perry) a secret letter, of which the final paragraph is unclassified and which supports this position in comparison with basing MX in Minuteman silos:

"Thus, while it is technically feasible to equip MM III with GBS, I do not recommend it either as a replacement for MX or as an adjunct to it. In both cases, survivability is by far the most important dimension and it is not improved by GBS. Placement of GBS as an adjunct in a relatively non-survivable MM III system raises the specter of its use primarily as a first strike weapon since it cannot be expected to perform credibly in a trans-attack mode.

Sincerely,

/signed/ BILL PERRY (11/29/79).

Now that MX is no longer claimed to solve Minuteman vulnerability but has the primary purpose of posing a threat to Soviet silos, we ought to pose that threat as cheaply as possible. Furthermore, building and testing the MX will exhaust our "one new strategic missile" allowed under SALT II, and therefore *impede* progress toward the Midgetman. Most practically, so long as there is an MX program, its backers represented by the powerful organizations (and measured by the funds involved) will cast the Midgetman as a costly and long-delayed weapon.

Finally, it has been argued that the Soviet Union has no reason to fear a limited deployment of 100 MX (with 1000 warheads), even with silo-killing accuracy, because 1000 warheads are too few to pose a first-strike threat. But it is not the symbolism of the MX which would provide it with any leverage as a bargaining chip; it is the possibility that a full-scale development and a production of 100 missiles is in no way different from beginning a program which would lead to 500 MX (and 5000 warheads). A credible MX bargaining chip preserves the domestic ambiguity as to the extent of the MX program. A year or two hence, serious proposals for Multiple Protective Shelter systems (or Dense Pack) will reappear, and the Congress should understand that cancelling the MX now is the only way to avoid these costly and still vulnerable systems. In his statement, Harold Brown explicitly notes approvingly that the MX deploy-

ment" . . . might, by a future expansion, ultimately threaten all Soviet ICMs."

We neither need nor want the MX now. It will interfere with attending to our own national security concerns. As I testified to the Commission on Strategic Forces, I recommend attention to the survivability of our command and control systems; to the measured expansion of the air-launched cruise missile force on the B–52 bomber fleet; and to the development of buried-bomb defense of 100 Minuteman silos. I recommend that a commitment to development and deployment be made now for Midgetman, with the first 450 Midgetmen to replace Minuteman II in the silos, and with the preferred mode of deployment of further Midgetman being in small, special-purpose silos of hardness about 1000 psi, and hence very low cost.

In arms control, I believe that the new approach of limiting warheads could effectively be achieved by ratifying the already signed SALT–II treaty, and then approaching the Soviet Union with a protocol which would allow the exchange of two of the land-based MIRV warheads (of which each side is entitled to 8200 under SALT II) for a single Midgetman in a new-construction small silo. This would have features of the "guaranteed build-down" now under discussion in Congress. The protocol should preferably ban land-mobile ICBMs, but there would be the clear possibility (if the protocol were not accepted by the Soviet Union) that the United States could deploy large numbers of Midgetman in a mobile mode.

There has been much comment about the "greater cost" of the single-warhead ICBM deployment, in comparison with the "cost-effectiveness" of MIRV. While this was true in the 1960s. I believe that it is no longer valid. In fact, a Midgetman built well within the technology established by MX (and deployed in small silos) is likely to be very considerably cheaper than MIRVed alternatives. Taking just the guidance system (for which there obviously has to be one per warhead in a Midgetman system), the maximum additional cost is given by the $0.5-million cost of an off-the-shelf guidance system capable of doing the job. In comparison with the $26-M cost per deployed warhead of Dense Pack (or the comparable cost of the Multiple Protective Shelter system) this special cost associated with the Midgetman is negligible.

U.S. Presidents have for years recommended the deployment of the MX as a cure for the vulnerability of Minuteman missiles. Now that the Commission on Strategic Forces has eliminated this aspect of deployment (and shown that this emphasis was mistaken), it would be more in keeping with the American pragmatic spirit to abandon the MX and to choose, forthwith, the deployment of the Midgetman instead. Under these circumstances, Midgetman would not be a 1990s system, but deployment could begin in 1987 and be complete in two years. This would even allow an efficient, competitive development, far less expensive for such a small missile than for a large MX.

Senator WARNER. We do have several questions. I will lead off.

Dr. Teller, at this very moment my colleagues are elsewhere in this building determining a proposed budget and that budget will be below the mark established by the President in his request. We are confronted with a prior authorization under the strategic program.

First, I would like to inquire as to what priority you would assign the program discussed today; and second, if necessary, which programs would you remove from the modernization to find the needed funds assuming we can't add dollars?

Dr. TELLER. Thank you very much.

I would first like to be only partially responsive to your question and comment on what my good friend, Danny, has said.

He said he does not quite agree with me about mutual support of the allies. That cannot be because I agree with him. This is, in part, responsive to your question because I think we should move as soon as possible to make this defensive effort a joint enterprise, it should serve all of us and it should be paid for by all of us.

I think we are in a position where we had better start. But before we begin to spend the billions which in the end will be needed, I hope that we will have real contributions from the British and Japanese and many others.

Now, as to the actual budget figures for 1984 I have made concrete suggestions to the House Armed Services Committee and they included for the kind of shortwave laser which I consider essential, $150 million.

You will note that this is quite a bit below some of the requests for deployment of longwave lasers and, therefore, I hope that no financial restriction interferes.

On the third generation nuclear weapons which I believe are extremely important and which are being criticized in much greater detail than I have had a chance to represent or that I have had a chance to rebut in the time available, the need for the money there is, as I calculated, and again I am speaking only for myself, I see as an absolute minimum $170 million for fiscal year 1984.

On the other hand, $270 million would be much better. But more than that I could not say now that it could be spent in a really cost-effective way. Therefore, for those defensive measures I have talked about, I am talking about an upper limit of $420 million and a lower limit of $320 million.

Now, I think there should be an additional allocation for these defensive purposes.

On the other hand, if this cannot be done without striking something out of the defense budget, I would first say that while we are developing defensive weapons, we will have to have retaliatory weapons. We still have to care for our stockpile.

But as to the diminution of the expenses for the stockpile, I think while it may be dangerous, I consider it considerably less dangerous than neglect of defense.

I am, therefore, arguing that somewhere between $320 million and $420 million should be spent on the two kinds of defense, not counting new detection methods, not counting very important projects in computer electronics that include really magnificent developments. These help in a variety of defenses, both nuclear defenses and relatively shortwave lasers.

Thus, I think the need of the budget is less than half a billion dollars.

General GRAHAM. Could I comment on that?

Senator WARNER. Yes; and I would also like you to address this statement.

As you know, General Graham, the Scowcroft Commission released a report containing findings that appear to be highly prejudicial to the approach being advocated here today.

In one section they said:

> Application of current ABM technology offers no real promise of being able to defend the United States against mass nuclear attack.

They added:

> At this time no ABM technology can contribute to practical viable low cost technical effectiveness such as to justify proceeding beyond the stage of technological development.

General GRAHAM. I disagree with them. I think it is very unfortunate in the very short time that they had to look at the defensive options that they would come out with such a strong negative.

Later on they do talk about some research and development on moneys for defensive systems. I think they are just quite wrong. I think that it is possible to deploy in the same mode as we have tail-gunners on bombers, a very cheap and quick defense of missiles that would not require further concrete around the silos.

In other words, I think that you could save enough money in construction to get an active defense point by point. If you want to constrain yourself to 100, as Dr. Garwin says, fine.

My view is if you do it with some of the simplest technologies available, that a good argument could be made that it is not contrary to the antiballistic missile treaty anyway.

In any case, there is a trade-off both in money and I think in military effectively that we should consider if we are going to be serious about strategic defenses. We can close the window of vulnerability quickly with this kind of system.

I did brief the Commission. I got a half hour's worth of High Frontier to the Commission stressing that point because of its connection with MX deployment.

My view was MX in Minuteman silos without the additional strengthening of the silos, that such a defense can prevent the destruction of the silos, cannot necessarily prevent a nuclear weapon from going off at some distance from the silo, but you can, given current yield of Soviet missiles and current accuracies, prevent the destruction of the missile in its silo, at least for two or three incoming rounds.

And if the Air Force cannot get the missiles out of the hole in such time, you should assign the missiles to the Marine Corps because they would.

Senator WARNER. As a former marine, I have to agree.

Doctor, your posture in this is very clear with this exception. I am not sure where you come down on the issue of the modernization we are now embarked on with respect to our defensive system.

Dr. TELLER. Mr. Chairman, I would like to claim, but I cannot claim to be a universal expert on many points of modernization. I cannot answer because I don't know enough.

There is one point in the modernization program that I know is strongly emphasized, and I believe should be even more strongly emphasized and that is defense against electromagnetic pulse.

The danger of electromagnetic pulse is real. We have information that the Soviets know a lot about that.

Furthermore, EMP is dangerous not only against military targets, but against a whole industry, against the whole of civilian life. I believe that big segments of our industry are simply ignorant of this danger and do not take precautions, even those that might be made at limited cost.

The development of this kind of modernization probably starting from the Armed Forces, but insuring our industry so that our Armed Forces don't have to work in a vacuum. I think modernization including the civilian sector is something to which I would give a high priority.

Senator WARNER. Dr. Garwin?

Dr. GARWIN. On the more conventional aspect of modernization of strategic forces I strongly support the Scowcroft Commission and I believe we should deploy as soon as we can the small ICBM, I would put the first 450 of them in the Minuteman II silos because people say those missiles are getting old. We should try hard to get an arms control agreement with the Soviet Union—also as recommended by the Commission—which would allow the deployment of many more of those small missions in small silos, a most economical means of deployment which could be combined with one of the "guaranteed build-down" approaches so that if each side gave up one of the MIRV'd warheads to which it was entitled of the—820 times 10, for instance, in SALT II—then it could build only half of the small ICBM's, give up two MIRV'd warheads to build a small silo and small ICBM.

I believe we can do that much more rapidly than the Scowcroft Commission suggests and I believe the small submarines are much nearer term and desirable.

I believe we will not have any of those things so long as we have an MX missile program. I have seen too many times in the past a heavily funded mature program thrash around and squash all these fragile plans which everybody agrees are the right way to go.

Furthermore, the analysis by the Scowcroft Commission, with which I agree, namely, a more reasonable view of the so-called window of vulnerability looking at the overall U.S. strategic force capability, does not in any way call for the deployment of the MX missile.

So, I believe for all the reasons, including the problem of the budget, the MX should be canceled forthwith.

On the matter of the bargaining chip to threaten the Soviet silos as the Soviet threaten our silos, I long argued after studies for the Government, for the White House, for the Defense Department, long communications with members of the Commission in their previous roles, that if we want to threaten Soviet silos, we should do that more cheaply and sooner by improving the accuracy of the Minuteman III warhead.

SILO-KILLING FORCE OBTAINABLE BY ACCURACY UPGRADE

We can do that in 3 or 4 years and not have to wait for the 5 or 6 or pay the very big cost associated with the MX development. If we wanted to do it more thoroughly, threaten the Soviet silos, with shorter flight time, more numerous warheads, we could equip the Trident I. (not Trident II, but Trident I, missiles) with receivers for NAVSTAR satellite signals and make those into silo killers.

If one really wants to have a silo-killing capability for a bargaining chip, (and I am not speaking either for or against that now, I am just saying if that is what you want) you can do it sooner and more cheaply than by deploying the MX missile.

The MX missile will have adverse effects in suppressing the agreed proper direction for the evolution of our strategic forces either to prepare for an arms race or to prepare for massive reductions by a factor of 10 or 20, not just 30 percent or 50 percent.

At that time it would be more embarrassing and vulnerable to have a thousand warheads present as 50 MX's and a couple of Trident sub-

marines than to have them on 500 Midgetmen and 100 aircraft and 75 submarines.

Senator WARNER. Gentlemen, we thank you very much. I will insert the testimony of George Rathjens for the record.

[Prepared statement by George Rathjens follows:]

PREPARED STATEMENT BY GEORGE RATHJENS

Mr. Chairman, Members of the Subcommittee: I welcome the opportunity to comment on the question of ballistic missile defense and in particular on the possibility of using space-based, directed-energy weapons for that purpose, a possibility that has commanded particular attention since the President's call of March 23 for a new national ballistic missile defense effort.

Even if such a defense could be totally effective against adversary ballistic missiles, it would not meet the President's objective of "rendering nuclear weapons impotent and obsolete" unless we could also develop essentially 100 percent effective defenses against other means of nuclear weapons delivery, notably cruise missiles, against which a space-based defense would be ineffective. Subsequent to the President's announcement, Secretary Weinberger made it clear that the Administration has in mind our developing those kinds of defenses as well. Taken literally, all this represents a complete reversal in U.S. thinking about nuclear weapons and their role in world affairs.

The reversal prompts questions on which I should like to comment briefly:

(1) Is there a technical basis for believing that an effective defense against ballistic missiles—and other means of weapons delivery—is possible? I do not believe so—and, neither such concepts as "High Frontier" nor development of nuclear-driven x-ray lasers or other exotic kill mechanisms will likely change this—if one assumes that an adversary will take measures to defeat or destroy the defense. There are three fundamental problems that have to be faced. Nuclear weapons can be so destructive and our cities and other institutions are so fragile that defense must be essentially perfect if the President's objectives are to be met; 99 percent would not be nearly good enough. Second, the defense must be able to cope with a very large number of objects in a very short period of time, destroying all or discriminating between those that carry warheads and those that do not; all this when, at any given time, most of the defense satellites would be in positions where they could not be used. Third, the defense—a very complex system—must work the first time. There will never be an opportunity for a realistic shake-down trial.

(2) What adversary reaction should we expect should we try to deploy such a defense? Both sides have worked on defensive systems in the past: air defenses, ballistic missiles defenses, anti-submarine warfare defenses. In each case, the other has improved its offensive capabilities, including developing countermeasures, to defeat the defenses, often anticipating their actual implementation. Surely, we must expect a similar reaction in this case if defense appears to be remotely feasible; and, if we demand high performance for the defense, cost-exchange considerations will surely favor the offense: for every hundred billion dollars we spend on defense, the Soviets will compensate at much lower cost.

(3) Can defenses of the suggested kind be developed, tested and deployed without amendment or abrogation of the ABM treaty? The answer is 'no'. Some relevant research can be done, and is being done, within the constraints of the Treaty, but article V is explicit, "Each Party undertakes not to develop, test or deploy ABM systems or components which are . . . space-based . . ."

(4) Is the President's proposal consistent with our obligations and policies regarding NATO and other allies? Clearly, not. The whole approach smacks of a retreat to a "Fortress America"; and this is true even if it is assumed that a space-based BMD system can defend our allies, as well as the United States, against Soviet ballistic missiles. How would they be defended against delivery of Soviet nuclear weapons by means other than ballistic missiles? And, even if that should be possible—if nuclear weapons could, indeed, be made "impotent and obsolete"—would the Administration judge that in our, and our allies', interest, considering its insistence that we must hold open the possibility of U.S. first-use of nuclear weapons to deal with Soviet conventional attack?

(5) If space-based, directed-energy defenses against ballistic missiles prove to be infeasible, might not a limited deployment be effective—and desirable—as

an anti-satellite system? Effective? Possibly—the task is much less demanding than 100 percent effective BMD—but it does not follow that development and deployment would necessarily be desirable. If we deploy such ASAT systems, the Soviets would almost surely do so too; and in such a competition, we are likely to be the losers inasmuch as we are more dependent on military satellites than they. We would be better off with mutual forbearance.

(6) In making his announcement, was the President adequately informed, and was it a responsible statement? These are embarassing questions to raise, but it is hard to avoid them considering that the prospects of 100 percent effective defense are almost vanishingly small; that holding out that hope to Americans is cruel and misleading if such a defense is not realistic; and that the implications for foreign policy are serious if it is. Does the Administration really believe that there is a realistic possibility of such a defense? If "yes," what is the basis, and is it prepared to face the consequence for alliance relations? If "no," would not some clarification of its position be desirable?

Let me conclude with my own overall assessment of defense possibilities. Notwithstanding the optimism of the President and Secretary Weinberger, we had all better realize that security in the nuclear age is not to be found through technical fixes. Rather, to the extent it can be had, it must be largely through arms control, arms reduction and the prudent resolution of political differences.

Senator WARNER. There will be some questions. We will ask you to submit replies for the record.

[Questions with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR JOHN W. WARNER

RESOURCE ALLOCATION

Senator WARNER. In March of this year, before this subcommittee, you outlined the comprehensive program currently underway in the Department of Defense to study and develop ballistic missile defense technologies. Do you feel that this program is adequate to meet the President's newly stated objectives, or would you recommend that we divert resources from other programs to accelerate BMD technology programs? If so, from which programs should such diversions be made?

Mr. GARDNER. It is premature to consider diverting funds from other programs at this time. A more opportune time to assess such reprograming may be upon completion of the Presidentially directed study on Defense Against Ballistic Missiles.

Senator WARNER. What changes to the BMD program outlined in the fiscal year 1984 budget request are dictated by the shift from deployment of MX-Peacekeeper in the closely spaced basing system to the deployment of MX in Minuteman silos?

Mr. GARDNER. In the fiscal year 1984 BMD budget request, $40.3 million was specifically identified for maintaining the option to defend Peacekeeper in Closely Spaced Basing. This amount, less that required for the inspections of Sprint and Spartan boosters, will be requested to be reprogramed to investigate such advanced technologies as referred to in the President's speech of 23 March 1983.

SOVIET SPACE DEFENSE

Senator WARNER. This year's edition of "Soviet Military Power" contains information about Soviet actions in the area of ballistic missile defense, particularly relating to the construction of battle management radars, that raises serious questions about their future compliance with the ABM Treaty. Do you have any concerns about the record of Soviet compliance with the ABM Treaty to date? How about prospects for their continued observance of the treaty's terms?

Dr. COOPER. As stated in "Soviet Military Power", the USSR has made a major commitment to improving the Hen House network by building new phased-array radars on the borders of the USSR. The Soviets continue to pursue extensive ABM research and development programs, including a rapidly deployable ABM system and improvements for the Moscow ABM defenses. As long as they do not "provide a base" for nationwide Ballistic Missile Defense, such activities are

allowed by the Treaty; nevertheless they are of concern because they indicate that the Soviet Union is aggressively developing an option to deploy an ABM system significantly larger in scope than that allowed by the ABM Treaty.

COOPER RE: WALLOP DATA

Senator WARNER. Dr. Cooper, would you comment upon the assessment of the state-of-the-art of laser weapons presented by Senator Wallop earlier today? Do you now concur in the estimates he alluded to with respect to the costs of the proposed system, its initial operational capability date, and its effectiveness.

Dr. COOPER. All of the "estimates" made to date are not really estimates, they are at best educated guesses, even though a great deal of effort by many people has gone into their making. And the "educated" part of the educated guess is minimal, because very little experimental data exists. There are enormous uncertainties in the technologies which have not been experimentally demonstrated, particularly those for hardening potential targets against the effects of such weapons as Senator Wallop proposes, and the total nature of the battle management problem for the weapon systems he proposes. We should proceed with the program which the Department of Defense has defined and presented to the Congress to conduct the experiments and analyses to resolve the uncertainties. Only then could any real confidence be placed in any "estimate" of the cost and schedule to deploy a space-based laser weapon system for some particular mission application(s).

OFFENSE AND DEFENSE

Senator WARNER. Can you envision a BMD system that would be so effective that it would preclude the need for offensive strategic forces to maintain deterrence?

Dr. COOPER. No we can not; such a system would have to be a perfect system. In the real world that we live in there must be some judicious mix of offense and defense forces.

Senator WARNER. Would you discuss the problems and opportunities associated with defense of a small mobile, single warhead ICBM? In general terms, what type of a BMD system do you think would be best suited for such a missile?

Dr. COOPER. These questions are now being addressed in the Presidentially directed study on Defense Against Ballistic Missiles and will be available when the study is completed this October.

DIRECTED ENERGY WEAPONS COST ESTIMATES

Senator WARNER. Dr. Cooper, Senator Pressler cited figures provided by the Defense Department which indicate that a limited BMD system employing space based lasers would cost on the order of $100 billion. Is that still a valid estimate? Is the estimate of $500 billion for a leakage limiting space-based BMD system still valid?

Dr. COOPER. The answer to this question is identical to that given to the question concerning my comment on Senator Wallop's "estimates." All of the "estimates" made to date are not really estimates, they are at best educated guesses, even though a great deal of effort by many people has gone into their making. And the "educated" part of the educated guess is minimal, because very little experimental data exists. There are enormous uncertainties in the technologies which have not been experimentally demonstrated, particularly those for hardening potential targets against the effects of such weapons as Senator Wallop proposes, and the total nature of the battle management problem for the weapon systems he proposes. We should proceed with the program which the Department of Defense has defined and presented to the Congress to conduct the experiments and analyses to resolve the uncertainties. Only then could any real confidence be placed in any "estimate" of the cost and schedule to deploy a space-based laser weapon system for some particular mission application(s).

COSTS AND TRADEOFFS

Senator WARNER. General Graham, on previous occasions you have stated that a High Frontier system could be deployed by 1988 at a cost of just $15 billion. The Department of Defense estimates that it would be at least $50 billion. In either case, we are talking about a substantial commitment of resources. As you

know, considerable constraints have been placed on the defense budget this year. From what areas would you divert funds to finance the High Frontier proposal? Would you recommend that we divert resources from the modernization of our offensive nuclear forces?

General GRAHAM. First, let me state what the root of the problem is between our cost estimates and those of others. High Frontier's costs and time for deployment depend on a special management system of a Manhattan Project-type. Further our cost estimates take into account the economies of scale introduced when we produce and deploy over 400 identical satellites (as opposed to the very small numbers of any one satellite produced in the past).

The bigger cost estimates are based on the cost-inflating acquisition system involved in business-as-usual and the unnecessary longtime frames it engenders. Further, we find most high estimates are based on the experience factors for producing fewer than ten of any given piece of space machinery. This has meant a hand-tooled, very expensive production process and a huge chunk of R&D costs attached to each end item. These approaches produce unrealistically high cost estimates.

With regard to tradeoffs in DOD budgets, we at High Frontier are strong proponents of the modernization programs of MX, B–1, and Trident. But we are not strong proponents of spending enormous sums on the passive defenses for the MX which are so costly that they overwhelm the actual cost of the weapon as in the cases of Racetrack and Dense Pack. Active defenses such as proposed in High Frontier can lower the vulnerability of MX better and at far less cost.

There are a number of DOD programs which are costly and which would be either unnecessary or of much lower priority if strategic defenses against ICBMs were fielded. These are quite independent of the necessity to replacing aging offensive systems with modern ones. For example, there is over $18 billion worth of hardening of our C^3 system to withstand the full, unfiltered impact of a Soviet missile salvo. Certainly some of these programs are less urgent if we can sharply degrade the Soviet ICBM threat. Rebasing of SAC bombers is another program which can be restudied. These are but examples of a large number of military programs which are made necessary in the light of a continued adherence to the offense-only doctrines of MAD but which lose importance or even cogency in a balanced offense-defense new strategy as proposed by High Frontier and the President.

THE ABM TREATY

Senator WARNER. General Graham, would you discuss the High Frontier proposals relationship to the ABM Treaty. Could this system be deployed within the constraints of the ABM Treaty? If not, what would you recommend we do with respect to that treaty?

General GRAHAM. The Senate of the United States placed a condition on the ratification of the ABM Treaty which provided essentially for U.S. withdrawal should there not be real progress toward equitable agreement on offensive systems. Certainly the latter has not occurred over the intervening 13 years. Thus the basis for simple nulling has been laid.

Further, if one reads Article 2 of the treaty where it spells out what is considered to be an ABM in the Treaty, one will find that the spaceborne systems and even the point defense systems proposed by High Frontier do not fit the description. At least this case can be effectively argued legalistically. On the other hand, there are clauses elsewhere in the document which attempt to deal with future systems on which the opposite case can be made. The question of whether or not High Frontier can be pursued while averring compliance with the treaty is a matter of whether one wishes to play attorney for or against.

Probably the most practical approach is to propose amendments to the Treaty which would permit either or both sides to deploy non-nuclear, purely defensive systems in space which would remove both sides from the threat of a first strike—that threat which drives the size of offensive nuclear stockpiles inexorably upward despite the efforts of U.S. negotiators.

C^3

Senator WARNER. General Graham, you state in your report that the High Frontier concept would not be dependent on ground-based C^3I or warning. Are you suggesting that this system will function fully autonomously during a conflict? And if so, would you comment on the battle management problems we are likely to encounter under these circumstances?

General GRAHAM. The High Frontier spaceborne systems would be capable of fully autonomous operation when required. The system must be able to sense a Soviet missile salvo, track them, and predict intercept points in space, and launch interceptors to those points, all without human intervention.

However, this fully autonomous mode would be operative only at times of high tension when the Soviet Union and other space-capable nations had been duly warned.

In normal times, there would be human control over the defensive system; the system would engage no target unless instructed to do so, thus preventing interference with peaceful access to space, including missile testing. A control node would exist in Cheyenne Mountain, and we would hope later in space as part of the Space Operations Center in order to reduce the vulnerability of ground communications links. It would make sense to provide for the fully autonomous mode to become operative in the case of hostile disruption of the command links.

It would also make sense to place within the memories of the on-board computers a threshold of numbers of missile launches above which the system would take action autonomously.

It is important to note that the human control of the system must be positive to avert accidental firing on peaceful accesses to space, but that control must be over the defensive system as a whole, not over the individual satellites, let alone over individual hit vehicles (literally pieces of ammuntion) aboard. Should we attempt precise battle management over all the elements of such a system we could run technical complexities and costs "off the charts." Some DOD analysts have demanded "command override" over the individual hit vehicles. This is unrealistic, akin to command override of individual artillery shells.

We must remember that the system is non-nuclear and cannot kill anyone (except a man in space). As such, it is not necessary to create the kind of C^3 for the strategic defense that is required of offensive nuclear weapons. I am concerned that this critical distinction has been missed in some DOD analyses of C^3 for space defense.

SLBM'S

Senator WARNER. General Graham, as you know, submarine-launched ballistic missiles burn for a relatively short period of time and burn out at low altitudes. Under these circumstances, the effectiveness of a space-based kill vehicle system would be substantially degraded. How would the High Frontier system overcome the difficulties associated with a low trajectory SLBM attack against the United States, particularly as Soviet SLBM's acquire a hard-target kill capability?

General GRAHAM. Since the Soviets have opted for very long range SLBMs that behave much like their ICBMs, High Frontier copes well with much of that threat.

However, the spaceborne system cannot defend against close-in, low trajectory SLBM attacks. For at least some years to come, however, such an attack—while useful for retaliation—is not useful in a first strike against our retaliatory forces unless coupled with an ICBM attack. With the ICBM and longer range SLBM attack effectively filtered, the other Soviet systems are effective only for retaliation.

In this respect, it may be well that we would not be denying a Soviet retaliatory capability because such an impermeable defense might so threaten the Soviets that they would take drastic action to prevent its deployment. But such perfect defenses have never existed in the past and will not in the future.

LWIR/SWIR

Senator WARNER. General Graham, tracking an ICBM in its earliest stages of flight, which is what your proposal purports to do, requires both short- and long-wave infrared (SWIR and LWIR) homing sensors. LWIR can track an ICBM against the background of space, but only a SWIR homing sensor can track a booster against an Earth background. A SWIR/LWIR engagement sensor is not off-the-shelf-technology, and there would be some risk associated with its development. How do you intend to overcome this problem?

General GRAHAM. It was our finding that Long Wave Infrared Sensors can track against an earth background if the heat source is large and intense as is the case with Soviet missile tail plumes. As we understand the sensor argument with regard to High Frontier's proposal, cryogenically cooled two-color LWIR

sensors are not available for long duration on a space vehicle. Such sensors may be required in our proposed second-layer, second generation system.

High Frontier's scientific and engineering consultants are looking at alternative sensing devices (mini-radar and ultra-violet) with a view to increasing capabilities for intercept beyond the boost-post boost phase. However, your question poses the first challenge we have yet encountered to the capability to sense the Soviet missiles against the earth background. I will put this question to our technical team and forward their responses.

HIGH FRONTIER

Senator WARNER. General Graham, according to the High Frontier proposal, we would deploy several hundred satellites in space by 1988. How do you propose to deploy all these satellites in such a short period of time? Clearly, the programmed Space Shuttle schedule could not meet this requirement. Where do you propose we get this launch capacity?

Are the full costs of launchers required for High Frontier factored into the estimates of your program's costs?

General GRAHAM. The High Frontier contention that we could deploy the defensive satellites for $15 billion within five or six years (not necessarily "by 1988" since decisions on system and management mode are critical) was based on insertion of the defensive satellites by the booster for MX. We subsequently determined that the Shuttle could be used. If a Shuttle were dedicated to this mission alone, turn-around times could be shortened and the missions could become fairly routine. We believe that two and a half to three years' work by a dedicated shuttle could deploy the satellites required, beginning two and a half to three years after a "go" decision on the basic system.

START-UP COSTS

Senator WARNER. General Graham, on March 16, 1982, before this subcommittee, you said that your High Frontier proposal could be initiated in fiscal year 1983 at a cost of $800 million. You went on to say that all this money could be diverted from current programs that would not be required if High Frontier were deployed. Could you be more specific in outlining the programs that would not be necessary, and from which funding could be diverted, under a High Frontier system?

General GRAHAM. In March 1982, when we made the calculation of $800 million start-up costs (for all eight of the proposed High Frontier programs, civil and military) the Racetrack MX system was still being pressed by DOD. Later, Dense Pack was proposed. We were certain that a small fraction of those deployment costs would cover the $800 million start-up costs easily and, over time, the costs of the entire High Frontier proposal.

Senator WARNER, Dr. Teller, you were the subject of a front-page story in the New York Times last Thursday, April 28, 1983, that raised questions about a possible conflict of interest you might have.

Would you care to submit a statement for the record on this article and its charges?

Dr. TELLER. The New York Times accused me by statements and innuendo of a conflict of interest between my activities advising deterrence by protective defense and my participation in a company called Helionetics. These are the facts:

I was given no stock, I purchased it.

Helionetics has nothing to gain from the program of developing purely defensive weapons. Helionetics' main product is a device to convert DC power to precisely controlled AC power. While Helionetics works on lasers, these have too low an intensity to serve as weapons. Helionetics is not involved in any way with x-ray lasers.

In the past year, Helionetics' direct sales to the government amounted to 23 percent of its total sales (13 percent for energy devices, 10 percent for laser development), not 70 percent as printed by the New York Times.

In the week preceding the President's March 23 speech there was an increase of 35 percent in Helionetics stock trading—well within normal market fluctuations. I did not have, and could not have had, any influence on this (as the New York Times implied), because I did not know about the President's announcement until two hours before the announcement was actually made.

CREDIBLE RETALIATORY FORCES

Senator WARNER. Dr. Garwin, in your statement, you have made a strong case for credible retaliatory forces as the essential component of deterrence. Yet in other contexts, you seem to minimize the importance of modernizing our retaliatory systems to maintain their effectiveness. Would you comment?

Dr. GARWIN. If I believed that the *effectiveness* of our retaliatory systems was in question, I would feel great urgency to modify them. Because of the 1972 SALT–I Treaty limiting ABM systems, our ICBMs and SLBMs have no problem penetrating to their targets. Our SLBMs face essentially no Soviet ASW threat and are thoroughly survivable. Our ICBMs might be destroyed by Soviet ICBMs, but the Scowcroft Commission has concluded (and I agree) that this is not a credible threat so long as the submarines are survivable and the bombers can take off from their bases in substantial numbers before those bases are struck with nuclear weapons. The ALCM carried by the B–52 fleet has no difficulty penetrating present and foreseeable Soviet air defense.

Furthermore, in an official letter to me of March 28, 1978, former Assistant Secretary of the Navy for Research and Development, David E. Mann, assured me that there is no problem of hull corrosion or metal fatigue in the indefinite operation of our submarine fleet, contrary to oft-repeated statements in support of the Trident program. Similarly, if the Minuteman missiles show problems with aging fuel grain, their motors could be re-poured, at modest cost.

Finally, as I have testified since 1979, if one wants to increase the effectiveness of our systems not in retaliation but in the threat to destroy Soviet ICBM silos, this is readily achievable by improving accuracy of the Minuteman missiles or by fitting Navstar receivers to the Trident–I missiles. In this way a large number of silo-killing warheads could be obtained long before MX could be available. All these statements can be documented with correspondence from former Under Secretary of Defense William J. Perry, from former Air Force Chief of Staff Lew Allen, and others. It is also true that a great deal of uncertainty could be introduced in the effectiveness of an assumed Soviet ICBM attack on Minuteman by the deployment of either SWARMJET or a buried nuclear bomb defense of the Minuteman silos.

With all these elements of modernization I agree; the MX should be canceled because it will interfere with doing anything sensible to maintain the retaliatory effectiveness of our strategic systems or even to increase their capability for a first strike!

ASATS

Senator WARNER. Dr. Garwin, you have been a vocal opponent of U.S. efforts to develop and deploy an anti-satellite weapon. Yet as you noted the Soviet Union has already deployed an operational anti-satellite weapon. If the United States halts its ASAT program, what incentive would there be for the Soviets to agree to ban these weapons? How would you expect to verify the dismantling of the Soviet ASAT now in-being?

Dr. GARWIN. I do not propose to halt our ASAT program. I propose to carry it through to its completion, short of space-testing of the miniature homing vehicle (MHV). At that point, I believe that we will be closer than the Soviets to an effective all-altitude ASAT system than the Soviets would be, and it would be an appropriate time to stop. Because we could never provide effective verification of dismantling of our F–15 ASAT system, it would seem nonnegotiable to demand the dismantling of the Soviet ASAT, although its test and its use would both be banned.

The present Soviet ASAT is not much of a threat to the satellites on which we would depend in a nuclear war. Because even ordinary ABM systems (with nuclear warheads) could be used against low-altitude satellites, no dismantling of the Soviet ASAT (even if complete and verified) could eliminate the threat in nuclear war to these satellites.

One does what one can, and the elimination of the instantaneous threat of destruction to all our satellites (which would be available with the deployment of space mines) would be a major advance. My testimony of May 18, 1983, to the Subcommittee on Arms Control, Oceans and International operations and Environment (of the Senate Committeee of Foreign Relations) goes into more detail on this.

Senator WARNER. I thank everyone for their presence today. The hearing is adjourned.

[Whereupon, at 5:30 p.m., the subcommittee adjourned.]

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